

SITE INVESTIGATION
I. M. C. AGRI BUSINESS RAINBOW DIVISION
(TENNESSEE VALLEY FERTILIZER)
EPA ID No.: ALX0001923325
CERCLA SITE REF. No.: 6699

70046

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FLORENCE, LAUDERDALE COUNTY, ALABAMA
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*NRAP APPROVED
BJ 8/12/99*

*See figure 1 behind
references for sample
locations.*

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Date: *March 12, 1999*

Prepared by: *Jerremy Stamps (Site Investigator)*
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Site: *Tennessee Valley Fertilizer*
Florence, Lauderdale County, Alabama

EPA ID No: *ALD0001923325*
CERCLIS No.: *6699*

1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U. S. Environmental Protection Agency and the Alabama Department of Environmental Management (ADEM), a Site Investigation (SI) was conducted at the Tennessee Valley Fertilizer site in Florence, Lauderdale County, Alabama. The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA or other authority, and, if appropriate, support site evaluation using the Hazardous Ranking System (HRS) for proposal to the National Priorities List (NPL). The investigation included reviewing previous information, sampling waste and environmental media to test Preliminary Assessment (PA) hypotheses and to evaluate and document HRS factors.

2. SITE DESCRIPTION

2.1 Location

The Tennessee Valley Fertilizer site is located in Lauderdale County, Alabama near the north bank of the Tennessee River (Figure 1). More specifically, the site is approximately a 16-acre parcel of land located in the North ½ of the Northwest ¼ of Section 13, Township 3 South, Range 11 West (Reference 1). The geographic coordinates of the site are 34° 47' 52.42" North Latitude and 87° 39' 18.11" West Longitude (Reference 1; Reference 3).

Lauderdale County has a temperate climate with abundant precipitation well distributed throughout all seasons. Statistically, Lauderdale County receives the most precipitation, 6.1 inches, during the month of February and the least precipitation, 2.0 inches, during the month of October. The normal annual total precipitation for Lauderdale County is 49.5 inches. Runoff in Lauderdale County is less than 26 inches per year and the mean annual lake evaporation is approximately 40 inches. (Reference 4)

For Lauderdale County, the mean annual maximum temperature is approximately 97° F and the mean annual minimum temperature is approximately 9° F. On a monthly average, January is the coldest and July is the warmest. January has an average low temperature of 34° F and July has an average high temperature of 91° F. (Reference 4)

2.2 Site Description

The Tennessee Valley Fertilizer site is located in the North ½ of the Northwest ¼ of Section 13, Township 3 South, Range 11 West in the town of Florence, Lauderdale County, Alabama (Figure 1). The facility is bound on the north by Veterans Drive and then by commercial and industrial properties; on the south by Sweetwater Creek and then by the Florence Canal; on the east by Sweetwater Creek and then by industrial and commercial properties; on the west by a power line right-of-way and then by heavily vegetated woods.

The Tennessee Valley Fertilizer site is an approximately 16-acre parcel of industrial property. The northern, western and part of the southern border of the site is fenced. The remaining borders are bounded by Sweetwater Creek. When the facility is not in use a security guard walks the premises (Reference 1). The only people who are likely to be exposed to any surficial contamination at the site are the workers that work daily on the site. Currently there are 70 to 75 workers employed at the site (Reference 1).

2.3 Operational History and Waste Characteristics

I. M. C. Agri Business (Tennessee Valley Fertilizer) is one of the world's leading private enterprise producers and makers of crop nutrients. The company has undergone a series of name changes since 1909, when the company was first established. Today the company is called I. M. C. Agri Business, Rainbow Division, which is a division of I. M. C. Global Operations Inc. (Reference 1)

Contacts for the Tennessee Valley Fertilizer site are:

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International Agricultural Corporation (IAC) was formed on June 14, 1909. The Florence facility was built between 1909 and 1910. The facility produced fertilizer by what is known as a batch process. By 1964 the process had changed to a granulation process and is still in use today. This plant produces approximately 140,000 tons of premium granular fertilizer annually. Prior to the fertilizer plant beginning, the original building on the site was used as a flour mill as early as 1860. (Reference 1)

Raw products come into the facility mostly by rail and most of the finished products leave the site by truck. The raw products are stored in warehouse stalls with concrete floors. The raw products are mixed in various concentrations and after a series of distinct steps the granular fertilizer is produced and bagged for sale. (Reference 1)

There are several waste sources present at the site. The following waste sources were identified by Keevin Smith during his Preliminary Assessment (PA) of the site. Several drums were located in the truck shop which are used to collect waste lubricants and other products associated with the maintenance of machinery. A pond on the site is used to collect water from the washing of the trucks while parked on the truck pad. The pond is a rectangular impoundment with a depth of approximately 10 feet, and an area of approximately 9,324 square feet. (Reference 1)

All water collected on site is reported to be utilized in the production of the fertilizer. Analytical data of the collected stormwater is reported to have elevated levels of nitrogen. (Reference 1)

3. GROUND WATER PATHWAY

3.1 Hydrogeology

Lauderdale County is in the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim section is characterized by an alternating landscape of stream valleys and gently rolling hills of slight to moderate relief. The Tennessee Valley Fertilizer site, as well as most of the study area, is underlain by a sequence of carbonate rocks of Mississippian age. The youngest of the carbonate rock units is the Tuscumbia Limestone and the older is the Fort Payne Chert. These geologic units dip to the south and southwest at a rate of about 30 feet per mile. (Reference 7; Reference 8)

The Fort Payne Chert includes all rock between the Chattanooga Shale and the Tuscumbia Limestone. The Fort Payne Chert is a thin-bedded microcrystalline siliceous limestone unit with an average of about 50 percent blue-gray to smoky chert. The average thickness of the Fort Payne is about 150 feet. Many solution features are present in the Fort Payne (Reference 6).

The Tuscumbia Limestone formation is also known as the St. Louis or Huntsville Limestone. The general lithology of the Tuscumbia Limestone is a light-gray micritic or bioclastic limestone with white chert nodules common. Dark gray chert is found within the unit but is less common. The average thickness of the Tuscumbia is about 200 feet. Many solution features are present in the Tuscumbia and it is common for these features to be vertically controlled. (Reference 6)

All the public water supplies in Lauderdale County and Colbert County that utilize ground water get their ground water from the Tuscumbia-Fort Payne aquifer. The Tuscumbia-Fort Payne aquifer can be considered a partially confined aquifer. The underlying Chattanooga Shale makes the Tuscumbia-Fort Payne aquifer practically impermeable from below, and the presence of a low hydraulic conductivity residual mantle that overlies much of the study area decreases the likelihood of surface contamination entering into the aquifer from above. The Tuscumbia-Fort Payne aquifer is highly susceptible to surface contamination in areas where poorly drained land surfaces reside above the potentiometric surface of the aquifer. The Tuscumbia-Fort Payne aquifer is extremely susceptible to surface contamination in areas where dissolution processes have formed karst surface features such as sinkholes and disappearing streams. (Reference 6; Reference 12)

3.2 Ground Water Targets

There are no known public or private drinking water wells located within the 4-mile target radius (Reference 5). Since no drinking water wells have been identified in the area, the only targets of the ground water pathway are those that fall into the resources category. *Because of the lack of targets for the groundwater pathway, no analytical data was collected to determine if groundwater has been impacted by the Tennessee Valley Fertilizer site.*

3.3 Ground Water Conclusions

Due to the great amount of years that industry has been present in the community of Sweetwater, it is somewhat likely that the ground water in this community has become contaminated. *No drinking water wells have been identified in the area and therefore, no primary or secondary targets exist that could be exposed to the suspected contamination of the groundwater in the Sweetwater area.*

4. SURFACE WATER PATHWAY

4.1 Hydrology

The Tennessee Valley Fertilizer site lies within the 100-year flood plain of the Tennessee River Basin at an elevation of approximately 430 feet above mean sea level (Reference 10). Overland drainage exits the site via Sweetwater Creek located on the eastern and southern border of the site (Figure 1). Sweetwater Creek flows south and west from the site for approximately 2,000 feet and then discharges into the Tennessee River (Reference 2).

Once the overland drainage from the Tennessee Valley Fertilizer site enters into the Tennessee River it will travel northwestward, down the Tennessee River for the entire targeted 15-mile downstream surface water pathway. In the 15-mile surface water pathway, the Tennessee River has a an average flow of 32,800 million gallons per day (mgd) or 3,170 cubic feet per second (cfs). The lowest flow to which the Tennessee River will decline during 7 consecutive days on an average of once every 2 years of normal flow (7-day Q2) is estimated to be 13,800 cfs. The 7-day Q10 is estimated to be 7,800 cfs. (Reference 11; Reference 13)

4.2 Surface Water Targets

The 15-mile downstream surface water pathway (SWP) begins and ends on the Tennessee River (Reference 2). *Within the 15-mile surface water pathway, the*

Tennessee River is classified for water contact sports, fish and wildlife, and public water supply usage (Reference 16). There is one known drinking water intake within the targeted SWP, and it is located approximately 3.5 miles downstream of the site (Reference 5; Reference 6).

Along the entire targeted overland drainage and surface water pathways there are no known wetlands that could contact water from the site. The land along the banks of the Tennessee River and its intermittent tributaries might be critical to the support of many threatened and endangered terrestrial species (see list of terrestrial species in Section 5). The table below lists the aquatic wildlife that is thought to have a high probability of being exposed to contaminants from the Tennessee Valley Fertilizer site if a substantial amount of contamination was to enter into the surface water pathway:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Alabama cavefish	Endangered	Lauderdale Co. & Colbert Co.
Spotfin chub	Endangered	Lauderdale Co. & Colbert Co.
Cracking pearly mussel	Endangered	Tennessee River
Cumberland monkeyface pearly mussel	Endangered	Tennessee River
Fanshell	Endangered	Tennessee River
Little-wing pearly mussel	Endangered	Tennessee River
Purple cat's paw mussel	Endangered	Tennessee River
Ring pink mussel	Endangered	Tennessee River
Turgid-blossom pearly mussel	Endangered	Tennessee River
White wartback pearly mussel	Endangered	Tennessee River
Yellow-blossom pearly mussel	Endangered	Tennessee River

(Reference 14; Reference 15)

4.3 Surface Water Conclusion

Since fisheries, endangered aquatic wildlife and one drinking water intake are located within the 15-mile downstream surface water pathway, the following surface water and sediment samples were taken:

Table 1: Sweetwater Creek Surface Water Samples (Reference 19)

Sample ID	Reference ID	Parameter	Results	Units	MCL
AA13548	TVFSW1B	Cadmium	<MDL	Mg/L	0.005
AA13548	TVFSW1B	Chromium	<MDL	Mg/L	0.1
AA13548	TVFSW1B	Copper	<MDL	Mg/L	1.0
AA13548	TVFSW1B	Magnesium	2.84	Mg/L	N/A
AA13548	TVFSW1B	Manganese	<MDL	Mg/L	0.05
AA13548	TVFSW1B	Nickel	<MDL	Mg/L	0.1
AA13548	TVFSW1B	Zinc	<MDL	Mg/L	5.0
AA13548	TVFSW1B	Lead	<MDL	ug/L	15
AA13548	TVFSW1B	Mercury	<MDL	ug/L	2
AA13547	TVFSW1	Cadmium	<MDL	Mg/L	0.005
AA13547	TVFSW1	Chromium	<MDL	Mg/L	0.1
AA13547	TVFSW1	Copper	<MDL	Mg/L	1.0
AA13547	TVFSW1	Magnesium	11.2	Mg/L	N/A
AA13547	TVFSW1	Manganese	10.0	Mg/L	0.05
AA13547	TVFSW1	Nickel	<MDL	Mg/L	0.1
AA13547	TVFSW1	Zinc	<MDL	Mg/L	5.0
AA13547	TVFSW1	Lead	<MDL	ug/L	15
AA13547	TVFSW1	Mercury	<MDL	ug/L	2
AA13546	TVFSW1DG	Cadmium	<MDL	Mg/L	0.005
AA13546	TVFSW1DG	Chromium	0.019	Mg/L	0.1
AA13546	TVFSW1DG	Copper	<MDL	Mg/L	1.0
AA13546	TVFSW1DG	Magnesium	2.93	Mg/L	N/A
AA13546	TVFSW1DG	Manganese	0.076	Mg/L	0.05
AA13546	TVFSW1DG	Nickel	<MDL	Mg/L	0.1
AA13546	TVFSW1DG	Zinc	<MDL	Mg/L	5.0
AA13546	TVFSW1DG	Lead	<MDL	ug/L	15
AA13546	TVFSW1DG	Mercury	<MDL	ug/L	2

TVFSW1B = Background Surface Water Sample at Sweetwater Creek and Veterans Drive

TVFSW1 = Surface Water Sample at Tennessee Valley Fertilizer's Discharge Point into Sweetwater Creek

TVFSW1DG = Downgradient Surface Water Sample at Sweetwater Creek and Power Lines

Table 2: Sweetwater Creek Sediment Samples (Reference 19)

Sample ID	Reference ID	Parameter	Results	Units
AA13549	TVFSED1B	Cadmium	<MDL	ug/g
AA13549	TVFSED1B	Chromium	26.2	ug/g
AA13549	TVFSED1B	Lead	15.0	ug/g
AA13549	TVFSED1B	Magnesium	260	ug/g
AA13549	TVFSED1B	Manganese	346	ug/g
AA13549	TVFSED1B	Nickel	9.97	ug/g

AA13549	TVFSED1B	Zinc	94.6	ug/g
AA13549	TVFSED1B	Mercury	<MDL	ug/g
AA13550	TVFSED1DG	Cadmium	<MDL	ug/g
AA13550	TVFSED1DG	Chromium	22.9	ug/g
AA13550	TVFSED1DG	Lead	25.7	ug/g
AA13550	TVFSED1DG	Magnesium	493	ug/g
AA13550	TVFSED1DG	Manganese	280	ug/g
AA13550	TVFSED1DG	Nickel	12.6	ug/g
AA13550	TVFSED1DG	Zinc	104	ug/g
AA13550	TVFSED1DG	Mercury	<MDL	ug/g

TVFSED1B = Background Sediment Sample at Sweetwater Creek and Veterans Drive

TVFSED1DG = Downgradient Sediment Sample at Sweetwater Creek and Power Lines

In the surface water background sample taken from Sweetwater Creek, the only parameter above the detection limit was magnesium. Magnesium was also found in the surface water sample taken at Tennessee Valley Fertilizer's discharge point into Sweetwater Creek and in the surface water sample taken downgradient of Tennessee Valley Fertilizer. *The discharge sample had concentrations of magnesium higher than three times background.* (Table 1; Reference 19).

Manganese was the only other parameter found above the detection limit in Sweetwater Creek. *Both the Tennessee Valley Fertilizer discharge point sample and the downgradient sample had concentrations of manganese greater than three times background. The discharge and down gradient samples are also above the drinking water MCL's.* (Table 1; Reference 19)

Sediment samples were also taken from Sweetwater Creek upgradient and downgradient of the Tennessee Valley Fertilizer site. None of the parameters tested for were found to be significantly higher downgradient of the site than at the upgradient background sample location. *At both the upgradient and downgradient sample locations, none of the parameters were found to be at concentrations above standard residential screening levels.* (Table 2; Reference 19)

5. SOIL PATHWAY AND AIR EXPOSURE

5.1 Physical Conditions

The USDA Soil Survey, indicates that the Tennessee Valley Fertilizer site is underlain by Fullerton series soils. Soils of this type are formed from residuum weathered from cherty limestone. The soils of the Fullerton series are deep, well-drained soils with moderate infiltration, permeability and available water capacity. (Reference 4)

5.2 Soil and Air Targets

There are approximately 75 people working at the Tennessee Valley Fertilizer site. No people live on property immediately adjacent to the site and no daycare facilities were seen within $\frac{1}{4}$ of a mile of the site. The nearest School, Brandon Elementary School, is approximately $\frac{1}{4}$ of a mile northeast of the site (Reference 2; Reference 18). According to the Alabama 1990 census records (Reference 17), the average number of people living in homes located in the counties of Colbert and Lauderdale is 2.54 residents per household. In the following table, the total population within the target area has been broken down into sub-populations that live within each specified distance radius from the site:

<i>DISTANCE FROM SITE</i>	<i>POPULATION</i>
0 TO 1/4 MILE	253
>1/4 TO 1/2 MILE	208
>1/2 TO 1 MILE	3,212
>1 TO 2 MILES	13,572
>2 TO 3 MILES	15,560
>3 TO 4 MILES	15,455
TOTAL POPULATION	48,260

None of the Tennessee Valley Fertilizer site is considered to be a wetland environment. Within the 4-mile target area and the 15-mile surface water pathway are no known wetlands. It is not known if the Tennessee Valley Fertilizer site is a critical habitat for federally designated endangered or threatened species, but the table below list the terrestrial species that may utilize the land and surface waters located within the specified target areas:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Gray bat	Endangered	Tennessee Valley
Indiana bat	Endangered	Extreme North
Red Wolf	Endangered	Statewide
Backman's Warbler	Endangered	Statewide
Eskimo Curlew	Endangered	Statewide
American Peregrine Falcon	Endangered	Statewide
American Burying Beetle	Endangered	Statewide

Florida Panther	Endangered	Statewide
Red-cockaded woodpecker	Endangered	Statewide
Wood Stork	Endangered	Statewide
Bald Eagle	Endangered	Statewide
Arctic Peregrine Falcon	Threatened	Statewide

(Reference 14; Reference 15)

5.3 Soil and Air Pathway Conclusion

The soil exposure pathway probably has posed little threat to the local population. Because of the low likelihood of soil exposure, no soil samples were taken during the Site Investigation. A release of hazardous materials into the air is not suspected.

6. SUMMARY AND CONCLUSIONS

The Tennessee Valley Fertilizer site was originally discovered in order to determine if the site was a source of lead contamination found in the Florence Canal. Analytical surface water and sediment samples taken from Sweetwater Creek did not indicate that lead concentrations greater than background were entering into the surface water pathway from the Tennessee Valley Fertilizer site.

Analytical surface water and sediments samples did indicate that the Tennessee Valley Fertilizer site is responsible for magnesium, manganese and nitrate contamination in Sweetwater Creek. Surface water is not expected to be significantly impacted by these contaminants due to the large volume and flow rate of water within Sweetwater Creek and the Tennessee River.

Based on the current HRS model the I. M. C. Agri Business Rainbow Division (Tennessee Valley Fertilizer) site is not eligible for consideration to be added to the National Priorities List (NPL). Therefore, it is this writers opinion that the Tennessee Valley Fertilizer site should be NFRAPED.

7. REFERENCES

1. *Smith, Keevin M., I. M. C. Agri business Rainbow Division (Tennessee Valley Fertilizer) Preliminary Assessment, 1997, EPA ID No.: AI0001923325, CERCLA Reference No.: 6699 (Attachment 1)*
2. *U.S.G.S. 7.5 Minute Series Topographic Quadrangle Maps of Alabama: Florence 1971; Killen 1971; Cherokee 1988; Sinking Creek 1988; Leighton 1971; Tusculumbia 1971. Scale 1:24,000. (Attachment 2)*
3. U.S. Environmental Protection Agency, Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates, 1991. Calculation worksheet for the Tennessee Valley Fertilizer site.
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15. Department of Conservation and Natural Resources, 1991 Federally Listed Endangered/Threatened Species.
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17. Alabama State Data Center, Center for Business and Economic Research, College of Commerce and Business Administration, The University of Alabama. 1990 CENSUS Alabama Counties and Cities By Race.
18. State of Alabama-Department of Education, LEA Personnel System (EDLP471), 1992, Total Number of Pupils and Faculty by School and County
19. ***Alabama Department of Environmental Management, Stream Sediment and Surface Water Analytical Data on Sweetwater Creek. Tennessee Valley Fertilizer CERCLA Site No.: 6699. 1999 Sample ID No.: AA13546, AA13547, AA13548, AA13549 and AA13550. (Attachment 4)***

NOTE: (References in bold italic print attached)

A hand-drawn map of the Fort Meade area. The map shows several rectangular buildings of varying sizes. A road, labeled "Road", runs horizontally across the upper middle. A creek, labeled "Sweetwater Creek", flows from the bottom left towards the center. A dashed line, labeled "Fence", runs vertically on the right side. A road, labeled "Veterans Drive", runs diagonally from the bottom right towards the center. Several sample locations are marked with stars and labeled: "Down Stream Sample" at the top left, "Discharge Sample" near the center left, and "Up Stream Sample" at the bottom. The text "Fort Meade" is written in the center of the map.

ATTACHMENT 1

Date: *September 23, 1997*

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Lauderdale County*

EPA ID No.: *AL0001923325*

Ref. No.: *6699*

1 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U. S. Environmental Protection Agency and the Alabama Department of Environmental Management (ADEM), a Preliminary Assessment (PA) was conducted at the IMC Agri Business in Florence, AL. The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA/SARA or other action. The scope of the investigation included a review of available file information, a comprehensive target survey, and a site reconnaissance on a comprehensive target survey..

2. SITE DESCRIPTION, SITE HISTORY, AND WASTE CHARACTERISTICS

2.1 Location

I. M. C. Agri Business is located by driving north on Hyw 65 from Montgomery to the town of Decatur. Then traveling in a western direction on Hyw 20 which is a synonymous name for Alt 72 west to the town of Muscle Shoals then driving north on Hyw 43 until arriving at the town of Florence. Then take Hyw 72 east, which is a synonymous name for Tennessee Ave. Take a right off of Tennessee Ave. onto Court St. and go for a about $\frac{3}{4}$ of a mile, then another right onto Veterans Dr. Go approximately $\frac{3}{4}$ of a mile and you will find the facility on the right. (Reference 18)

The IMC Agri Business Site is located in Lauderdale County, in the town of Florence, Alabama—Township 3 South, Range 11 West; Section 13, North $\frac{1}{2}$, Northwest $\frac{1}{4}$; at

latitude 34° 47' 57.42" and longitude 87° 39' 18.11" (Attachment 1). More specifically, the site is approximately a 16 acre parcel of land. (Reference 1; Reference 2).

2.2 Site Description

Lauderdale County has a temperate climate with abundant precipitation well distributed throughout all seasons. Statistically, Lauderdale County receives the most precipitation, 6.1 inches, during the month of February and the least precipitation, 2.0 inches, during the month of October. The normal annual total precipitation for Lauderdale County is 49.5 inches. Runoff in Lauderdale County is less than 26 inches per year and the mean annual lake evaporation is approximately 40 inches. (Reference 3)

For Lauderdale County, the mean annual maximum temperature is approximately 97° F and the mean annual minimum temperature is approximately 9° F. On a monthly average, January is the coldest and July is the warmest. January has an average low temperature of 34° F and July has an average high temperature of 91° F. (Reference 3)

The site is bounded on its northern side by Veterans Dr., to the east is Sweetwater Creek, to the south, the Florence Canal, and to west a small portion of woods. The western part and a portion of the southern part of the facility are fenced, which makes the site practically inaccessible to the public. When the facility is not in use a security guard walks the premise. The only people that are likely to be exposed to any surficial contamination at the site are the workers that work daily at the site. Currently there are approximately 70 to 75 workers employed at the site. (Reference 19; Reference 20)

I. M. C. Agri Business is involved in the production of fertilizer. When Bonnie Temple and I visited the site on August 14, 1997 the facility looked clean as could be expected. We met with Larry Larkin-Plant Manager, Larry Hodge-Environmental Health and Safety, Mark Gay-Assistant Plant Manager, and Mike Kenna-Environmental Manager. Most of the site is floored in asphalt or concrete. All storage tanks are diked by a concrete barrier except for the anhydrous ammonia and propane tanks, both of these are a gas. All tanks are inspected once a year by ultra sound methods and found to be in satisfactory condition. Some stressed vegetation was noted behind the big warehouse and around the pond, which the plant manager, attributes to the application of Roundup. Near the railroad tressel was a small area of stained soil and gravel, which was due to the railroad parking a backhoe on the area. At one time there was a burn pile located on the site. Wooden pallets and cardboard boxes were burned. However that practice has since stooped and the sulfate potash building sits atop the old burn pile. (Reference 19; Reference 20)

Sweetwater Creek borders the site on the East. It has a gravel bottom and water flows year round. The creek appeared clean and free of litter. There is an abandoned PVC pipe on the eastern side of the property. This was used to carry water from a potash ditch to the pond. The potash ditch is no longer there and the pipe is not in use.

There are currently in use approximately 225 feet of lead-lined pipe and a 2500 gal. vat for mixing sulfuric acid. Five spills have occurred at the facility from 1991 to 1996. Proper procedures were taken, appropriate parties were notified, necessary forms filled out and filed with the state of Alabama. This facility produces a byproduct called hydrofluoro silicic acid or known as HFS. For the year 96/97, 537 tons were produced and sold Harcross Chemical who sells to various city water treatment plants. (Reference 20)

When touring the site, the facility was not in operation due to maintenance and conducting repairs. The plant manager said the facility had been down for seven weeks but would start back in operation on August 18, 1997. It was a hot day with the temperature in excess of 90°F, with little wind blowing. However no odors or annoying irritants were present. (Reference 20)

2.3 Operational History and Waste Characteristics

I. M. C. Agri Business is one of the world's leading private enterprise producer and marketer of crop nutrients. The company had undergone a series of name changes since 1909, when the company was first established. The name changed from International Agricultural Corp. to International Minerals and Chemicals Corp., Plant Food Division to International Fertilizer Ink Rainbow Division to I. M. C. Agri Business, Rainbow Division which is a division of I. M. C. Global Operation Ink. However the sign at the Florence, AL. facility reads "I. M. C. Fertilizer Rainbow Division." (Reference 20)

The Agri Business headquarters address:

I. M. C. Agri Business, Ink
6 Executive Drive
Collinsville, IL 62234
1-800-767-2855 Ex. 442 Contact-Mike Kenna
1-618-346-7451

The Company headquarters is:

I. M. C. Global Operation Ink
2345 Waukegan Rd.
Suit E200
Bannockburn, IL 60015
1-847-607-3000 Contact-Carylin Merrit

International Agricultural Corporation (IAC) was formed June 14, 1909 by three men, Thomas C. Meadows, Oscar L. Dortch and Waldemar A. Schmidtman. The Florence, AL. facility was built between 1909 and 1910. The facility produced fertilizer by what is known as a batch process. By 1964 the process had changed to a granulation process and is still in use today. This plant produces about 140,000 tons of premium granular fertilizer annually. Also it claims the distinction of being the Corporation's oldest

continuously operating production facility. Prior to its beginnings in 1909 as a fertilizer plant, the original building had been used as a flour mill as early as 1860. (Reference 20)

Raw product mostly comes into the facility by railroad. Most of the finished product leaves by truck, very little is sent out by rail. This raw product is housed in large warehouses. Stalls are used to separate the product and the floor is concrete. This raw product is mixed in various concentrations and after a series of distinct steps the granular fertilizer is produced and bagged. (Reference 19)

There are several waste sources present at the site. The following sources were noticed while touring the site. Several drums were located in the truck shop which are used to collect waste lubricants and other products associated with maintenance of machinery. They appeared to be in excellent condition, free from leaks, properly painted and labeled. A pond on the site is used to collect water from the washing of trucks while parked on the truck pad. It is a rectangular impoundment with an area of 9324 sq. ft. The depth is approximately 10 feet. The bottom is composed of rock and clay. The pond should receive large quantities of storm water run off from the facility. (Reference 20)

All water collected on site in ditches or dikes is pumped into the pond and then used back in the production of fertilizer, or in some cases the water is pumped directly from the ditch or low area back into the production of fertilizer. Stormwater runoff is monitored by four outfalls as it leaves the property. According to analytical data the stormwater runoff is impacted by elevated nitrogen levels. (Reference 19; Reference 20; Attachment 14)

3. GROUND WATER PATHWAY

3.1 Hydrogeologic Setting

Lauderdale County is in the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim section is characterized by alternating landscape of stream valleys and gently rolling hills of slight to moderate relief. The I.M.C. Agri Business site, as well as most of the study area, is underlain by a sequence of carbonate rocks of Mississippian age. The youngest of the carbonate rock units is the Tuscumbia Limestone and the oldest is the Fort Payne Chert. These geologic units dip to the south and southwest at a rate of about 30 feet per mile. (Reference 6; Reference 7)

The Fort Payne Chert includes all rock between the Chattanooga Shale and the Tuscumbia Limestone. The Fort Payne Chert is a thin-bedded microcrystalline siliceous limestone unit. The average thickness of the Fort Payne Chert is about 150 feet. Many solution features are present in the Fort Payne. (Reference 5)

The Tuscumbia Limestone formation is also known as the St. Lewis or Huntsville Limestone. The general lithology of the Tuscumbia Limestone is a light-gray micritic or bioclastic limestone with white chert nodules. Dark gray chert is found within the unit but is less common. The average thickness of the Tuscumbia is about 200 feet. (Reference 5)

All the public water supplies in Lauderdale County and Colbert County that utilize ground water get their ground water from the Tuscumbia-Fort Payne aquifer. The Tuscumbia-Fort Payne aquifer can be considered a partially confined aquifer. The underlying Chattanooga Shale makes the Tuscumbia-Fort Payne aquifer practically impermeable from below, and the presence of a low hydraulic conductivity residual mantle that overlies much of the study area decreases the likelihood of surface contamination entering into the aquifer from above. The Tuscumbia-Fort Payne aquifer is highly susceptible to surface contamination in areas where poorly drained land surfaces reside above the potentiometric surface of the aquifer. The Tuscumbia-Fort Payne aquifer is extremely susceptible to surface contamination in areas where dissolution processes have formed karst surface features such as sinkholes and disappearing streams. (Reference 5; Reference 11)

3.2 Ground Water Targets

There are no known public or private drinking water wells located within the 4-mile target radius. Since no drinking water wells have been identified in the area, the only targets of the ground water pathway are those that fall into the resources category, which encompasses future ground water use. (Reference 4)

3.3 Ground Water Conclusions

Due to the numerous years that industry has been present in the community of Sweetwater, it is somewhat likely that the ground water in this community has become contaminated by metals, volatiles, and semi-volatiles. No drinking water wells have been identified in the area and therefore, no primary or secondary targets exist that could be exposed to the suspected contamination of the groundwater in the Sweetwater area. There are no analytical data to represent the fact a release has or has not taken place (Reference 19; Reference 20)

4. SURFACE WATER PATHWAY

4.1 Geomorphologic Setting

The I. M. C. Fertilizer Plant lies within the 100-year flood plain of the Tennessee River Basin at an elevation of approximately 440 to 450 feet above mean sea level (Reference 9). Overland drainage exits the site via Sweetwater Creek located on the east border of the site (Attachment 2). Sweetwater Creek flows south from the site for approximately 1-mile and then discharges into the Tennessee River (Attachment 2).

Once the overland drainage from The I. M. C. Fertilizer site enters into Sweetwater Creek it will travel westward to the Tennessee River and, down the Tennessee River for the entire targeted 15-mile downstream surface water pathway. In the 15-mile surface water pathway, the Tennessee River has an average flow of 32800 million gallons per day (mgd) or 3170 cubic feet per second (cfs). The lowest flow to which the Tennessee River will decline during 7 consecutive days on an average of once every 2 years of normal

flow (7-day Q2) is estimated to be 13800 cfs. The 7-day Q10 is estimated to be 7800 cfs. (Reference 10; Reference 12)

Station Number	7-day, 2-year low flow	7-day, 10-year low flow
03589450	3.2 ft ³ /s	0.9 ft ³ /s
03589452	3.1 ft ³ /s	0.7 ft ³ /s
03589500	10700 ft ³ /s	8650 ft ³ /s

Station #03589450 Lat 34° 48' 24", Long 87° 39' 18" in NW1/4 SW1/4 sec. 12, T 3 S., R. 11 W., Lauderdale County, Hydrologic Unit 06030005, at Union Avenue in Florence, .1 mi from East Florence Park. (Sweetwater Creek),(Reference 12)

Station #03589452 Lat 34° 47' 52", long 87° 39' 18" in NE 1/4 NW 1/4 sec. 13, T. 3 S., R. 11 W., Lauderdale County, Hydrologic Unit 06030005, at railroad trestle, 0.3 mi downstream from union Avenue, and at mile 0.61 in Florence, AL. (Sweetwater Creek) Reference 12)

Station #03589500 Lat 34° 47'13", long 87° 40' 12": in SW ¼ sec. 14, T. 3 S., R. 11W., Lauderdale County, Hydrologic Unit 06030005, at lower end of Patton Island, 700 ft. upstream from O'Neal Bridge on U.S. Highway 72, 1.7 mi upstream from Cypress Creek, 2.7 mi downstream from Wilson Dam, and at mile 256.7. (Tennessee River) Reference 12)

4.2 Surface Water Targets

The 15-mile downstream surface water pathway (SWP) begins and ends on the Tennessee River (Attachment 2). Within the 15-mile surface water pathway the Tennessee River is classified for water contact sports, fish and wildlife, and public water supply usage (Reference 15). There is one known drinking water intake within the targeted SWP, and it is located approximately 3.5 miles downstream of the site (Reference 4; Reference 5). Along the entire targeted overland drainage and surface water pathways there are no known wetlands that could come in contact with water from the site. The I.M.C. Agri Business site, and the land along the banks of the Tennessee River and its intermittent tributaries might be critical to the support of many threatened and endangered terrestrial species (see list of terrestrial species in Section 5.2). The table below lists the aquatic wildlife that is thought to have a high probability of being exposed to contaminants from the I.M.C. Agri Business site if a substantial amount of lead or other contaminant was to enter into the surface water pathway:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Alabama Cavefish	Endangered	Lauderdale Co & Colbert Co.
Cracking Pearly Muscle	Endangered	Tennessee River

Cumberland MonkeyfacePearly Mussel	Endangered	Tennessee River
Fanshell Muscle	Endangered	Tennessee River
Purple Cat'Paw Muscle	Endangered	Tennessee River
Ring Pink Mussel	Endangered	Tennessee River
Turgid-Blossom Pearly Mussel	Endangered	Tennessee River
White Wartback Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Yellow-Blossom Pearly Mussel	Endangered	Tennessee River
Orange Footed-Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Pink Mucket Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Rough Pigtoe Mussel	Endangered	Lauderdale Co. Tennessee River
Slackwater Darter	Endangered	Lauderdale Co. Tennessee River

(Reference 13; Reference 14)

4.3 Surface Water Conclusion

Fisheries, endangered aquatic wildlife, and one drinking water intake are located within the 15-mile downstream surface water pathway. Stormwater runoff is definitely present at the site with elevated nitrogen levels. A release to surface water has occurred and is still occurring presently. While lead contamination has been identified in the Florence Canal, no samples exist to indicate any contribution from this facility at this time. (Reference 20)

5. SOIL EXPOSURE AND AIR PATHWAY

5.1 Physical Conditions

The USDA Soil Survey indicates that the site is underlain by Fullerton series soils. These soil types formed from residuum weathered from cherty limestone. The soils of the Fullerton series are deep well-drained soils with a moderate infiltration, permeability and available water capacity.

(Reference 3)

5.2 Soil and Air Targets

There are approximately 75 people working at the I.M.C Fertilizer site and no people living on properties immediately adjacent to the site. The nearest School, Brandon

Elementary School, is approximately ½ of a mile east of the site (Reference 1; Reference 17). No daycare facilities were seen within 1/2 of a mile of the site during the site reconnaissance. According to the Alabama 1990 census records (Reference 16), the average number of people living in homes located in the counties of Colbert and Lauderdale is 2.54 residents per household. In the following table, the total population within the target area has been broken down into sub-populations that live within each specified distance radius from the site:

<i>DISTANCE FROM SITE</i>	<i>POPULATION</i>
0 – ¼ mile	253
> ¼ -1/2 mile	208
>1/2 – 1 mile	3212
>1 - 2 miles	13572
2 –3 miles	15560
>3 –4 miles	15455
TOTAL POPULATION	48260

None of the I. M. C. Fertilizer site is considered to be a wetland environment. Within the 4-mile target area and the 15-mile surface water pathway are no known wetlands. It is not known if the I. M. C. Fertilizer site is a critical habitat for federally designated endangered or threatened species, but the table below list the terrestrial species that may utilize the land and surface waters located within the specified target areas:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Gray bat	Endangered	Tennessee Valley
Indiana bat	Endangered	Extreme North
Red Wolf	Endangered	Statewide
Backman's Warbler	Endangered	Statewide
Eskimo Curlew	Endangered	Statewide
American Peregrine Falcon	Endangered	Statewide
American Burying Beetle	Endangered	Statewide
Florida Panther	Endangered	Statewide
Red-cockaded woodpecker	Endangered	Statewide
Wood Stork	Endangered	Statewide
Bald Eagle	Endangered	Statewide
Arctic Peregrine Falcon	Threatened	Statewide

(Reference 13; Reference 14)

5.3 Soil Exposure and Air Pathway Conclusion

The soil exposure pathway will probably pose little threat to the local population. No fumes or odors were present when touring the facility.

SUMMARY AND CONCLUSIONS

Since 1909 I.M.C. Agri Business has been involved in the manufacture of fertilizer. The approximately 16-acre facility located at 1 Commerce St., Florence AL., produces 140,000 tons of fertilizer annually. The main area of concern from the site is in the form of surface water runoff. Ground water contamination could be a problem as well, however without sufficient analytical data a judgement call can not be stated. Soil and air exposure poses little threat to the local population and the environment. Current data indicates that contamination in the form of nitrates is present in stormwater runoff from the site. It is not expected that these nitrates are leaving the site in concentrations significantly elevated enough to have an impact on the surface water intake located on the Tennessee River. However contaminants could impact fisheries and sensitive environments along the surface water pathway.

While there is the potential for impact to groundwater at the site, no monitoring wells exist and additionally groundwater is not used locally for potable supplies.

Based on the concerns noted in the report, we recommend that the I. M. C. Agri Business site be placed in a category of further study with regard to CERCLA and this should be a moderate priority.

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20. Smith, Keevin M., *Alabama Department of Environmental Management, Special Projects*, Conversations with and information provided by Mr. Larry Larkin-Plant Manager, 14 August 1997.

ATTACHMENT 2

OVERSIZED

DOCUMENT

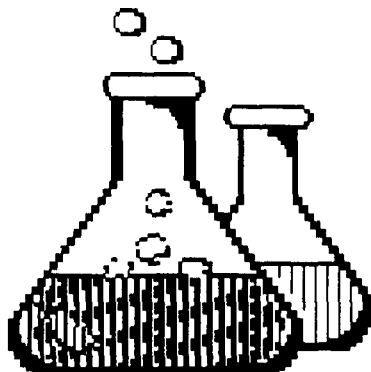
ATTACHMENT 3

OVERSIZED

DOCUMENT

ATTACHMENT 4

ADEM's MONTGOMERY LABORATORY ANALYSIS REPORT



ADEM's CENTRAL LABORATORY



Report Date: 2/2/99

Sample ID: AA13548

Client Information: JERREMY STAMPS

Your Reference: TVFSW1B

Collection Date: 1/12/99

This sample was received in our lab by: VEH

Collection Time: 2:55:00 PM

Sample Description: TENN. VALLEY FERTILIZER

Sample Collector: JERREMY STAMP Submittal Date: 1/14/99

Sample Matrix: WATER

Submittal Time: 2:00:00 PM

Fund Code: 521

Original Report Date: 2/2/99

Validation Date: 1/29/99

The results on the attached report are from the sample that was received and is referenced above. The sample was analyzed using standard EPA testing procedures and quality analysis protocol. Instrument calibration and quality control are within acceptable limits of precision and accuracy.

A close review by our Quality Assurance Program certifies that all prescribed test hold times were met and our strict quality assurance standards were observed.

Submitted by: Bill Brackin
Quality Assurance Manager

This cover sheet is an integral part of the analytical report that follows.

ADEM's Central Laboratory has met all Requirements for Certification by EPA Region IV to Analyze Samples for all of the Parameters Required Under the Safe Drinking Water Act.

Trace Metals

Method Reference..... EPA200.7

Date Completed...	1/19/99	Analyst.....	SJT		
Parameter	Result	Units	Method Detection Limit	CAS #	
Cadmium in Liquids	< MDL	mg/L	0.003	7440439	
Chromium in Liquids	< MDL	mg/L	0.015	7440473	
Copper in Liquids	< MDL	mg/L	0.02	7440508	
Magnesium in Liquids	2.84	mg/L	0.05	7439954	
Manganese in Liquids	< MDL	mg/L	0.02	7439965	
Nickel in Liquids	< MDL	mg/L	0.03	7440020	
Zinc in Liquids	< MDL	mg/L	0.03	7440666	

Trace Metals

Method Reference..... EPA239.2

Date Completed...	1/28/99	Analyst.....			
Parameter	Result	Units	Method Detection Limit	CAS #	
Lead by Graphite Furnace	< MDL	ug/L	2.00	7439921	

Trace Metals

Method Reference..... EPA245.2

Date Completed...	1/26/99	Analyst.....	SJT		
Parameter	Result	Units	Method Detection Limit	CAS #	
Mercury in Liquids	< MDL	ug/L	0.3	7439976	

STATE OF ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
MONTGOMERY, ALABAMA

LABORATORY: (✓) Montgomery () Mobile () Birmingham

Sample Type: Potable Water [] Landfill Leachate [] Toxic Extraction [] Composite []
 Surface Water [✓] Hazardous Wastesite [] Ignitability [] Grab []
 Soil/Sediment [] Groundwater [] Corrosivity [] Container P []
 Wastewater [] Waste (Special Handling) [] Reactivity [] G []

Source Tennessee Valley Fertilizer 521-6699

Location TVF5W1B - Background @ Sweetwater/Veterans Dr.

() Discharge from _____ to _____
 (Point Source) (Receiving Water)

Comments 14.9 °C Preservative(s) ICE HNO₃

pH 7.55 D.O. _____ Sp. Cond. 210 Salinity _____ Turb. _____

PARAMETERS

Date	Value	Date	Value	Date	Value	Date	Value
(mg/l)		(mg/l)		(mg/l)		(mg/l)	
Acid	_____	Phenol	_____	Al	_____	Mn	_____
ALK	_____	PO ₄ -P	_____	Ag	_____	Na	_____
BOD ₅	_____	(S ⁼)	_____	As	_____	Ni	_____
(Cl ⁻)	_____	(SO ₄ ⁼)	_____	Ba	_____	Pb	_____
COD	_____	TSS	_____	Ca	_____	Pt	_____
CN ⁻	_____	TDS	_____	Cd	_____	Sb	_____
(F ⁻)	_____	TFS	_____	Cr ^I	_____	Se	_____
Hard	_____	TKN	_____	Cr ⁺⁶	_____	Zn	_____
NH ₃ -N	_____	TOC	_____	Cu	_____	Other	_____
NO ₃ -N	_____	TON	_____	Fe	_____		_____
NO ₂ -N	_____	TS	_____	Mg	_____		_____
O & G	_____	VSS	_____		_____		_____

SAMPLE COLLECTED BY (Signature) Jeremy Stamps DATE/TIME 11/12/99 2:55pm RELINQUISHED BY (Signature) Jeremy Stamps DATE/TIME 11/14/99 2:00pm

RECEIVED BY (Signature) _____ DATE/TIME _____ RELINQUISHED BY (Signature) _____ DATE/TIME _____

RECEIVED BY (Signature) _____ DATE/TIME _____ RELINQUISHED BY (Signature) _____ DATE/TIME _____

RECEIVED IN LAB BY (Signature) Vernetta Patrick DATE/TIME 1-14-99 1400 LABORATORY V.# NO. AA13391 AA13548

SEND REPORT TO: Jeremy Stamps

ADEM's MONTGOMERY LABORATORY ANALYSIS REPORT



ADEM's
CENTRAL
LABORATORY



Report Date: 2/2/99

Sample ID: AA13546

Client Information: JERREMY STAMPS

Your Reference: TVFSW1DG

Collection Date: 1/12/99

This sample was received in our lab by: VEH

Collection Time: 3:36:00 PM

Sample Description: TENN. VALLEY FERTILIZER

Sample Collector: JERREMY STAMP Submittal Date: 1/14/99

Sample Matrix: WATER

Submittal Time: 2:00:00 PM

Fund Code: 521

Original Report Date: 2/2/99

Validation Date: 1/29/99

The results on the attached report are from the sample that was received and is referenced above. The sample was analyzed using standard EPA testing procedures and quality analysis protocol. Instrument calibration and quality control are within acceptable limits of precision and accuracy.

A close review by our Quality Assurance Program certifies that all prescribed test hold times were met and our strict quality assurance standards were observed.

Submitted by: Bill Brackin
Quality Assurance Manager

This cover sheet is an integral part of the analytical report that follows.

ADEM's Central Laboratory has met all Requirements for Certification by EPA Region IV to Analyze Samples for all of the Parameters Required Under the Safe Drinking Water Act.

Trace Metals

Method Reference..... EPA200.7

Date Completed...	1/19/99	Analyst.....	SJT		
Parameter	Result	Units	Method Detection Limit	CAS #	
Cadmium in Liquids	< MDL	mg/L	0.003	7440439	
Chromium in Liquids	0.019	mg/L	0.015	7440473	
Copper in Liquids	< MDL	mg/L	0.02	7440508	
Magnesium in Liquids	2.93	mg/L	0.05	7439954	
Manganese in Liquids	0.076	mg/L	0.02	7439965	
Nickel in Liquids	< MDL	mg/L	0.03	7440020	
Zinc in Liquids	< MDL	mg/L	0.03	7440666	

Trace Metals

Method Reference..... EPA239.2

Date Completed...	1/28/99	Analyst.....			
Parameter	Result	Units	Method Detection Limit	CAS #	
Lead by Graphite Furnace	< MDL	ug/L	2.00	7439921	

Trace Metals

Method Reference..... EPA245.2

Date Completed...	1/26/99	Analyst.....	SJT		
Parameter	Result	Units	Method Detection Limit	CAS #	
Mercury in Liquids	< MDL	ug/L	0.3	7439976	

STATE OF ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
MONTGOMERY, ALABAMA

99010025

LABORATORY:

(☒) Montgomery

() Mobile

() Birmingham

Sample Type: Potable Water [] Landfill Leachate [] Toxic Extraction [] Composite []
Surface Water [☒] Hazardous Wastesite [] Ignitability [] Grab []
Soil/Sediment [] Groundwater [] Corrosivity [] Container P []
Wastewater [] Waste (Special Handling) [] Reactivity [] G []

Source Tennessee Valley Fertilizer 521-6699

Location TVFSW1DG - Downgradient of Sweetwater Power Pl.

() Discharge from _____ to _____
(Point Source) (Receiving Water)

Comments 15.2 °C Preservative(s) ICE HNO₃

pH 7.26 D.O. _____ Sp. Cond. 2.35 Salinity _____ Turb. _____

PARAMETERS

Date	Value	Date	Value	Date	Value	Date	Value
(mg/l)		(mg/l)		(mg/l)		(mg/l)	
Acid	_____	Phenol	_____	Al	_____	Mn	_____
ALK	_____	PO ₄ -P	_____	Ag	_____	Na	_____
BOD ₅	_____	(S ⁼)	_____	As	_____	Ni	_____
(Cl ⁻)	_____	(SO ₄ ⁼)	_____	Ba	_____	Pb	_____
COD	_____	TSS	_____	Ca	_____	Pt	_____
CN ⁻	_____	TDS	_____	Cd	_____	Sb	_____
(F ⁻)	_____	TFS	_____	Cr ⁺	_____	Se	_____
Hard	_____	TKN	_____	Cr ⁺⁶	_____	Zn	_____
NH ₃ -N	_____	TOC	_____	Cu	_____	Other	_____
NO ₃ -N	_____	TON	_____	Fe	_____		
NO ₂ -N	_____	TS	_____	Hg	_____		
O & G	_____	VSS	_____	Mg	_____		

Jenny Stamps 1/12/98 3:36pm Jenny Stamps 1/14/98 2:00pm
SAMPLE COLLECTED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

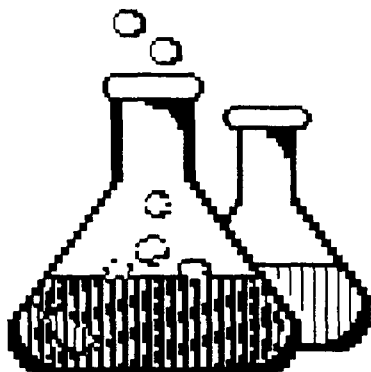
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RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

Vernell Patrick 1-14-98 1400 AA13389 AA13546
RECEIVED IN LAB BY (Signature) DATE/TIME LABORATORY NO.

SEND REPORT TO: Jenny Stamps

ADEM's MONTGOMERY LABORATORY ANALYSIS REPORT



**ADEM's
CENTRAL
LABORATORY**



Report Date: 2/2/99

Sample ID: AA13547

Client Information: JEREMY STAMPS

Your Reference: TVFSW1

Collection Date: 1/12/99

This sample was received in our lab by: VEH

Collection Time: 3:50:00 PM

Sample Description: TENN. VALLEY FERTILIZER

Sample Collector: JEREMY STAMP Submittal Date: 1/14/99

Sample Matrix: WATER

Submittal Time: 2:00:00 PM

Fund Code: 521

Original Report Date: 2/2/99

Validation Date: 1/29/99

The results on the attached report are from the sample that was received and is referenced above. The sample was analyzed using standard EPA testing procedures and quality analysis protocol. Instrument calibration and quality control are within acceptable limits of precision and accuracy.

A close review by our Quality Assurance Program certifies that all prescribed test hold times were met and our strict quality assurance standards were observed.

Submitted by: Bill Brackin
Quality Assurance Manager

This cover sheet is an integral part of the analytical report that follows.

ADEM's Central Laboratory has met all Requirements for Certification by EPA Region IV to Analyze Samples for all of the Parameters Required Under the Safe Drinking Water Act.

Trace Metals**Method Reference..... EPA200.7**

Date Completed...	1/19/99	Analyst..... SJT		
Parameter	Result	Units	Method Detection Limit	CAS #
Cadmium in Liquids	< MDL	mg/L	0.003	7440439
Chromium in Liquids	< MDL	mg/L	0.015	7440473
Copper in Liquids	< MDL	mg/L	0.02	7440508
Magnesium in Liquids	11.2	mg/L	0.05	7439954
Manganese in Liquids	10.0	mg/L	0.02	7439965
Nickel in Liquids	< MDL	mg/L	0.03	7440020
Zinc in Liquids	< MDL	mg/L	0.03	7440666

Trace Metals**Method Reference..... EPA239.2**

Date Completed...	1/28/99	Analyst.....		
Parameter	Result	Units	Method Detection Limit	CAS #
Lead by Graphite Furnace	< MDL	ug/L	2.00	7439921

Trace Metals**Method Reference..... EPA245.2**

Date Completed...	1/26/99	Analyst..... SJT		
Parameter	Result	Units	Method Detection Limit	CAS #
Mercury in Liquids	< MDL	ug/L	0.3	7439976

STATE OF ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
MONTGOMERY, ALABAMA

LABORATORY: (4) Montgomery () Mobile () Birmingham

Sample Type: Potable Water [] Landfill Leachate [] Toxic Extraction [] Composite []
Surface Water [] Hazardous Wastesite [] Ignitability [] Grab []
Soil/Sediment [] Groundwater [] Corrosivity [] Container P []
Wastewater [] Waste (Special Handling) [] Reactivity [] G []

Source Tennessee Valley Fertilizer 521-6699

Location TVFSW 1 Discharge - hidden discharge ppe to Sweetwater Creek

() Discharge from Tennessee Valley Fertilizer to Sweetwater Creek
(Point Source) (Receiving Water)

Comments 16.8°C green in water / odor Preservative(s) ICE HNO₃

pH 6.73 D.O. _____ Sp. Cond. 3,350 Salinity _____ Turb. _____

PARAMETERS

Date	Value	Date	Value	Date	Value	Date	Value
(mg/l)		(mg/l)		(mg/l)		(mg/l)	
Acid	_____	Phenol	_____	Al	_____	Mn	_____
ALK	_____	PO ₄ -P	_____	Ag	_____	Na	_____
BOD ₅	_____	(S ⁼)	_____	As	_____	Ni	_____
(Cl ⁻)	_____	(SO ₄ ⁼)	_____	Ba	_____	Pb	_____
COD	_____	TSS	_____	Ca	_____	Pt	_____
CN ⁻	_____	TDS	_____	Cd	_____	Sb	_____
(F ⁻)	_____	TFS	_____	Cr ^I	_____	Se	_____
Hard	_____	TKN	_____	Cr ⁺⁶	_____	Zn	_____
NH ₃ -N	_____	TOC	_____	Cu	_____	Other	_____
NO ₃ -N	_____	TON	_____	Fe	_____		
NO ₂ -N	_____	TS	_____	Hg	_____		
O & G	_____	VSS	_____	Mg	_____		

James Stamps 11/12/99 3:50pm F. Coli. _____
SAMPLE COLLECTED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

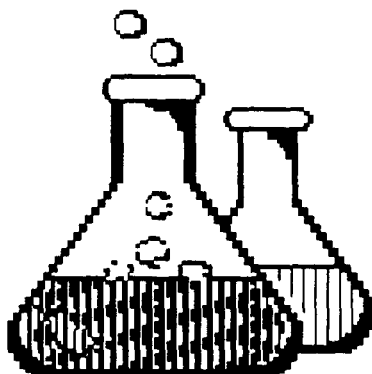
RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

Vernetta Patrick 1-14-99 1400 AA13390 AA13547
RECEIVED IN LAB BY (Signature) DATE/TIME LABORATORY NO.

SEND REPORT TO: James Stamps

ADEM's MONTGOMERY LABORATORY ANALYSIS REPORT



ADEM's
CENTRAL
LABORATORY



Report Date: 1/27/99

Sample ID: AA13549

Client Information: JERREMY STAMPS

Your Reference: TVFSED1B

Collection Date: 1/12/99

This sample was received in our lab by: VEH

Collection Time: 2:55:00 PM

Sample Description: TENN. VALLEY FERTILIZER

Sample Collector: JERREMY STAMP Submittal Date: 1/14/99

Sample Matrix: SOIL

Submittal Time: 2:00:00 PM

Fund Code: 521

Original Report Date: 1/27/99

Validation Date: 1/27/99

The results on the attached report are from the sample that was received and is referenced above. The sample was analyzed using standard EPA testing procedures and quality analysis protocol. Instrument calibration and quality control are within acceptable limits of precision and accuracy.

A close review by our Quality Assurance Program certifies that all prescribed test hold times were met and our strict quality assurance standards were observed.

Submitted by: Bill Brackin
Quality Assurance Manager

This cover sheet is an integral part of the analytical report that follows.

ADEM's Central Laboratory has met all Requirements for Certification by EPA Region IV to Analyze Samples for all of the Parameters Required Under the Safe Drinking Water Act.

Trace Metals

Method Reference..... EPA200.7

Date Completed...	1/27/99	Analyst.....	SJT	
Parameter	Result	Units	Method Detection Limit	CAS #
Cadmium in Soil	< MDL	ug/g	1.0	
Chromium in Soil	26.2	ug/g	1.5	
Lead in Soil	15.0	ug/g	10.0	
Magnesium in Soil	260	ug/g	5.00	
Manganese in Soil	346	ug/g	2.00	
Nickel in Soil	9.97	ug/g	0.90	
Zinc in Solids	94.6	ug/g	3.00	

Trace Metals

Method Reference..... EPA245.5

Date Completed...	1/26/99	Analyst.....	SJT	
Parameter	Result	Units	Method Detection Limit	CAS #
Mercury in Solids	< MDL	ug/g	0.10	

STATE OF ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
MONTGOMERY, ALABAMA

LABORATORY: (X) Montgomery () Mobile () Birmingham

Sample Type: Potable Water [] Landfill Leachate [] Toxic Extraction [] Composite []
Surface Water [] Hazardous Wastesite [] Ignitability [] Grab []
Soil/Sediment [X] Groundwater [] Corrosivity [] Container P []
Wastewater [] Waste (Special Handling) [] Reactivity [] G []

Source Tennessee Valley Fertilizer 521-6699

Location TVFSED 1B - Background @ Sweetwater & Veterans Dr.

() Discharge from _____ to _____
(Point Source) (Receiving Water)

Comments _____ Preservative(s) ICE

pH _____ D.O. _____ Sp. Cond. _____ Salinity _____ Turb. _____

PARAMETERS

Date	Value	Date	Value	Date	Value	Date	Value
(mg/l)		(mg/l)		(mg/l)		(mg/l)	
Acid	_____	Phenol	_____	Al	_____	Mn	_____
ALK	_____	PO ₄ -P	_____	Ag	_____	Na	_____
BOD ₅	_____	(S ⁼)	_____	As	_____	Ni	_____
(Cl ⁻)	_____	(SO ₄ ⁼)	_____	Ba	_____	Pb	_____
COD	_____	TSS	_____	Ca	_____	Pt	_____
CN ⁻	_____	TDS	_____	Cd	_____	Sb	_____
(F ⁻)	_____	TFS	_____	Cr ³⁺	_____	Se	_____
Hard	_____	TKN	_____	Cr ⁺⁶	_____	Zn	_____
NH ₃ -N	_____	TOC	_____	Cu	_____	Other	_____
NO ₃ -N	_____	TON	_____	Fe	_____		
NO ₂ -N	_____	TS	_____	Hg	_____		
O & G	_____	VSS	_____	Mg	_____		

James Stamps 1/12/99 2:55pm F. Coli. _____
SAMPLE COLLECTED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

Vernetta Patrick 1-14-99 1400 AA13549
RECEIVED IN LAB BY (Signature) DATE/TIME LABORATORY V.D. NO.

SEND REPORT TO: James Stamps

ADEM's MONTGOMERY LABORATORY ANALYSIS REPORT



ADEM's
CENTRAL
LABORATORY



Report Date: 1/27/99

Sample ID: AA13550

Client Information: JERREMY STAMPS

Your Reference: TVFSED1DG

Collection Date: 1/12/99

This sample was received in our lab by: VEH

Collection Time: 3:36:00 PM

Sample Description: TENN. VALLEY FERTILIZER

Sample Collector: JERREMY STAMP **Submittal Date:** 1/14/99

Sample Matrix: SOIL

Submittal Time: 2:00:00 PM

Fund Code: 521

Original Report Date: 1/27/99

Validation Date: 1/27/99

The results on the attached report are from the sample that was received and is referenced above. The sample was analyzed using standard EPA testing procedures and quality analysis protocol. Instrument calibration and quality control are within acceptable limits of precision and accuracy.

A close review by our Quality Assurance Program certifies that all prescribed test hold times were met and our strict quality assurance standards were observed.

Submitted by: Bill Brackin
Quality Assurance Manager

This cover sheet is an integral part of the analytical report that follows.

ADEM's Central Laboratory has met all Requirements for Certification by EPA Region IV to Analyze Samples for all of the Parameters Required Under the Safe Drinking Water Act.

Trace Metals

Method Reference..... EPA200.7

Date Completed...	1/27/99	Analyst..... SJT		
Parameter	Result	Units	Method Detection Limit	CAS #
Cadmium in Soil	< MDL	ug/g	1.0	
Chromium in Soil	22.9	ug/g	1.5	
Lead in Soil	25.7	ug/g	10.0	
Magnesium in Soil	493	ug/g	5.00	
Manganese in Soil	280	ug/g	2.00	
Nickel in Soil	12.6	ug/g	0.90	
Zinc in Solids	104	ug/g	3.00	

Trace Metals

Method Reference..... EPA245.5

Date Completed...	1/26/99	Analyst..... SJT		
Parameter	Result	Units	Method Detection Limit	CAS #
Mercury in Solids	< MDL	ug/g	0.10	

STATE OF ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
MONTGOMERY, ALABAMA

LABORATORY: (☒) Montgomery () Mobile () Birmingham

Sample Type: Potable Water [] Landfill Leachate [] Toxic Extraction [] Composite []
Surface Water [] Hazardous Wastesite [] Ignitability [] Grab []
Soil/Sediment [☒] Groundwater [] Corrosivity [] Container P []
Wastewater [] Waste (Special Handling) [] Reactivity [] G [☒]

Source Tennessee Valley Fertilizer 521-6699
Location TVFSED1 DG - Downgradient @ Sweetwater & Power Lines

() Discharge from _____ to _____
(Point Source) (Receiving Water)

Comments _____ Preservative(s) _____

pH _____ D.O. _____ Sp. Cond. _____ Salinity _____ Turb. _____

PARAMETERS

Date	Value	Date	Value	Date	Value	Date	Value
(mg/l)		(mg/l)		(mg/l)		(mg/l)	
Acid	_____	Phenol	_____	Al	_____	Mn	_____
ALK	_____	PO ₄ -P	_____	Ag	_____	Na	_____
BOD ₅	_____	(S ⁼)	_____	As	_____	Ni	_____
(Cl ⁻)	_____	(SO ₄ ⁼)	_____	Ba	_____	Pb	_____
COD	_____	TSS	_____	Ca	_____	Pt	_____
CN ⁻	_____	TDS	_____	Cd	_____	Sb	_____
(F ⁻)	_____	TFS	_____	Cr ^I	_____	Se	_____
Hard	_____	TKN	_____	Cr ⁺⁶	_____	Zn	_____
NH ₃ -N	_____	TOC	_____	Cu	_____	Other	_____
NO ₃ -N	_____	TON	_____	Fe	_____		_____
NO ₂ -N	_____	TS	_____	Hg	_____		_____
O & G	_____	VSS	_____	Mg	_____		_____

James Stamps 11/12/99 3:36pm James Stamps 11/14/99 2:40pm
SAMPLE COLLECTED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

RECEIVED BY (Signature) DATE/TIME RELINQUISHED BY (Signature) DATE/TIME

Kenneth Patrick 1-14-99 1400 AA13393 AA13550
RECEIVED IN LAB BY (Signature) DATE/TIME LABORATORY ID NO.

SEND REPORT TO: Jerreng Stamps

ATTACHMENT 5

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-362-3114 • FAX (205) 830-5053

LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-01
Date Sampled: 1997-03-05
Time Sampled: 1239

Parameter	Results	Method	Analyst	Date	Time
pH	6.65 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	2 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.07 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	30 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM

President and Principal Engineer

Southeast n Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-02
Date Sampled: 1997-03-05
Time Sampled: 1243

Parameter	Results	Method	Analyst	Date	Time
pH	6.71 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	1 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.1 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	96 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

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Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-03
Date Sampled: 1997-03-05
Time Sampled: 1245

Parameter	Results	Method	Analyst	Date	Time
pH	6.97 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	3 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.07 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	108 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-362-3114 • FAX (205) 830-5053

LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 009
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-04
Date Sampled: 1997-03-05
Time Sampled: 1247

Parameter	Results	Method	Analyst	Date	Time
pH	6.71 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	2 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.1 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	1175 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

IMC RAINBOW
FLORENCE, AL.

DATE: 3-5-97

STORMWATER OUTFALL
FLOW RATES

DAY: Wed.

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
12:39	DSN003 A	4.75	3 sec	1.58
12:43	DSN007 B	4.50	4 sec	1.13
12:45	DSN008 C	3.25	2 sec	1.63
12:47	DSN009 D	4.00	2 sec	2

Southeastern Safety and
SS&S
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-362-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 05/20/1997
Purchase Order No.: IMC

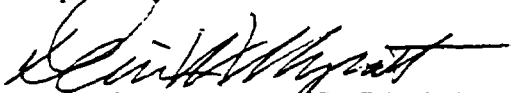
Lab. No.: 1971-1407-03
Date Sampled: 1997-05-19
Time Sampled: 0947

Parameter	Results	Method	Analyst	Date	Time
pH	6.62 su	4500-H+ B	tb	05-28-97	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	2.99 mg/L	4500-P C	tb	05-27-97	1330
Nitrogen-Kjeldahl	23 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,



Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeast n Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 05/20/1997
Purchase Order No.: IMC

Lab. No.: 1971-1407-01
Date Sampled: 1997-05-19
Time Sampled: 0942

Parameter	Results	Method	Analyst	Date	Time
pH	6.62 su	4500-H+ B	tb	05-20-97	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	2.64 mg/L	4500-P C	tb	05-27-97	1530
Nitrogen-Kjeldahl	5 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 05/20/1997
Purchase Order No.: IMC


Lab. No.: 1971-1407-04
Date Sampled: 1997-05-19
Time Sampled: 0936

Parameter	Results	Method	Analyst	Date	Time
pH	6.36 su	4500-H+ B	tb	05-20-97	1500
Oil and Grease	1 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	3.23 mg/L	4500-P C	tb	05-27-97	1330
Nitrogen-Kjeldahl	10 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

IMC RAINBOW
FLORENCE, AL.

DATE: 5-19-97

DAY: Monday

STORMWATER OUTFALL
FLOW RATES

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL/SEC
9:47	DSN003 A	3.25	11	.295
9:42	DSN007 B	2.75	12	.229
9:36	DSN008 C	2.25	10	.225
9:38	DSN009 D	2.50	5	.5

ATTACHMENT 6

44-6

CHEMICALS USED AT IMC-FLORENCE, AL.

ANHYDROUS AMMONIA
448 NITROGEN SOLUTION(69%AMMONIUM NITRATE, 25% AMMONIA, 6% WATER)
AMMONIUM SULFATE
MONOAMMONIUM PHOSPHATE
DIAMMONIUM PHOSPHATE
NORMAL SUPERPHOSPHATE
PHOSPHORIC ACID
TRIPLE SUPERPHOSPHATE
POTASSIUM CHLORIDE
POTASSIUM SULFATE
POTASSIUM-MAGNESIUM SULFATE
CALCIUM-SODIUM BORATE
ZINC OXIDE
IRON OXIDE
MANGANESE OXIDE
SULFURIC ACID
PHOSPHATE ROCK
SAND
VARIOUS GRADES OF FINISHED N-P-K FERTILIZER
FLUOROSILICIC ACID(PRODUCED AS A BY-PRODUCT FROM PRODUCTION OF
NORMAL SUPERPHOSPHATE)

APPENDIX C

SITE INSPECTION WORKSHEETS

This appendix consists of worksheets that can be used to generate an SI site score. Completion of these worksheets is not required, but the SI investigator must evaluate an SI score, either by these worksheets, PREscore, or other regional scoring tools.

The worksheets consists of instructions and data tables to be filled in with scores from HRS reference tables. The data tables may also call for Data Type and References.

Data Type: The Data Type columns should be filled in with an H, Q, or + if the data are HRS quality well documented. The Data Type column should be filled in with an E, X, or - if the data represents estimated, approximations, or are not fully documented. This type identifies data gaps for expanded SI to investigate

References: The Reference columns should be filled in with coded reference numbers. The numbered reference list should be attached or the numbering should be cross-referenced to the SI Narrative.

The SI investigator will need the current SCDM to complete these worksheets.

CONFIDENTIAL

SITE INSPECTION WORKSHEETS

CERCLIS ID NUMBER 6699

SITE LOCATION

SITE NAME I. M. C. AGRI BUSINESS RAINBOW DIVISION (TENNESSEE VALLEY FERTILIZER)			
ADDRESS VETERANS DRIVE			
CITY FLORENCE	STATE AL	ZIP CODE	TELEPHONE
COORDINATES: LATITUDE and LONGITUDE 34° 47' 52.42" N LAT 87° 39' 18.11" W LONG		TOWNSHIP, RANGE, and SECTION T 3 SOUTH R 11 WEST SECTION 13	

OWNER/OPERATOR IDENTIFICATION

OWNER I. M. C. AGRI BUSINESS INC.			OPERATOR		
ADDRESS 6 EXECUTIVE DRIVE			ADDRESS		
CITY COLLINSVILLE			CITY		
STATE IL	ZIP CODE 62234	TELEPHONE 1-800-767-2855	STATE	ZIP CODE	TELEPHONE

SITE EVALUATION

AGENCY ADEM FIELD OPERATIONS
INVESTIGATOR JERREMY H. STAMPS
CONTACT JERREMY H. STAMPS
TELEPHONE (334) 260-2714

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations.

The Tennessee Valley Fertilizer site is located in Lauderdale County, Alabama near the north bank of the Tennessee River. More specifically, the site is approximately a 16-acre parcel of land located in the North ½ of the Northwest ¼ of Section 13, Township 3 South, Range 11 West. The geographic coordinates of the site are 34° 47' 52.42" North Latitude and 87° 39' 18.11" West Longitude.

Lauderdale County has a temperate climate with abundant precipitation well distributed throughout all seasons. Statistically, Lauderdale County receives the most precipitation, 6.1 inches, during the month of February and the least precipitation, 2.0 inches, during the month of October. The normal annual total precipitation for Lauderdale County is 49.5 inches. Runoff in Lauderdale County is less than 26 inches per year and the mean annual lake evaporation is approximately 40 inches.

For Lauderdale County, the mean annual maximum temperature is approximately 97° F and the mean annual minimum temperature is approximately 9° F. On a monthly average, January is the coldest and July is the warmest. January has an average low temperature of 34° F and July has an average high temperature of 91° F.

The Tennessee Valley Fertilizer site is located in the North ½ of the Northwest ¼ of Section 13, Township 3 South, Range 11 West in the town of Florence, Lauderdale County, Alabama. The facility is bound on the north by Veterans Drive and then by commercial and industrial properties; on the south by Sweetwater Creek and then by the Florence Canal; on the east by Sweetwater Creek and then by industrial and commercial properties; on the west by a power line right-of-way and then by heavily vegetated woods.

The Tennessee Valley Fertilizer site is an approximately 16-acre parcel of industrial property. The northern, western and part of the southern border of the site is fenced. The remaining borders are bounded by Sweetwater Creek. When the facility is not in use a security guard walks the premises. The only people who are likely to be exposed to any surficial contamination at the site are the workers that work daily on the site. Currently there are 70 to 75 workers employed at the site.

I. M. C. Agri Business (Tennessee Valley Fertilizer) is one of the world's leading private enterprise producers and makers of crop nutrients. The company has undergone a series of name changes since 1909, when the company was first established. Today the company is called I. M. C. Agri Business, Rainbow Division, which is a division of I. M. C. Global Operations Inc.

Contacts for the Tennessee Valley Fertilizer site are:

Mike Kenna
I. M. C. Agri Business Inc.
6 Executive Drive
Collinsville, IL 62234
Phone: 1-800-767-2855 Ext. 422 or 1-618-346-7451

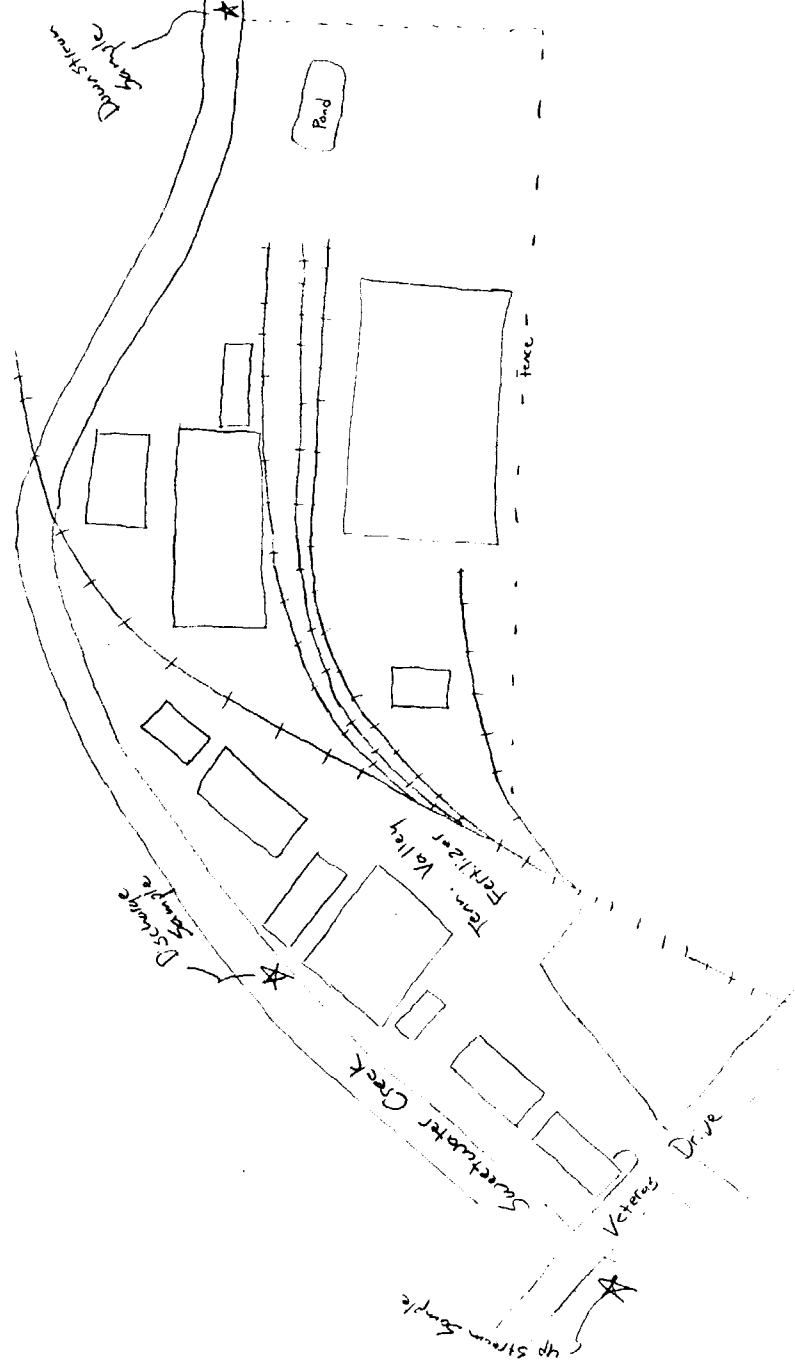
Carylin Meritt
I. M. C. Global Operations Inc.
2345 Waukegan Rd.
Suit E200
Bannock, IL 60015
Phone: 1-847-607-3000

International Agricultural Corporation (IAC) was formed on June 14, 1909. The Florence facility was built between 1909 and 1910. The facility produced fertilizer by what is known as a batch process. By 1964 the process had changed to a granulation process and is still in use today. This plant produces approximately 140,000 tons of premium granular fertilizer annually. Prior to the fertilizer plant beginning, the original building on the site was used as a flour mill as early as 1860.

Raw products come into the facility mostly by rail and most of the finished products leave the site by truck. The raw products are stored in warehouse stalls with concrete floors. The raw products are mixed in various concentrations and after a series of distinct steps the granular fertilizer is produced and bagged for sale.

There are several waste sources present at the site. The following waste sources were identified by Keevin Smith during his Preliminary Assessment (PA) of the site. Several drums were located in the truck shop which are used to collect waste lubricants and other products associated with the maintenance of machinery. A pond on the site is used to collect water from the washing of the trucks while parked on the truck pad. The pond is a rectangular impoundment with a depth of approximately 10 feet, and an area of approximately 9,324 square feet.

All water collected on site is reported to be utilized in the production of the fertilizer. Analytical data of the collected stormwater is reported to have elevated levels of nitrogen.



GENERAL INFORMATION (continued)

Site Sketch: Provided a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes building, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

GENERAL INFORMATION (continued)

Source Description: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after final deposition of waste materials.

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing waste; includes open dumps. Some types of waste piles are:

Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by products, radioactive waste, or used or unused feedstocks

Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances

Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.

Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS table 4-2), and air (see HRS table 6-3 and 6-9).

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (see HRS tables 2-5, 2-6, and 5-2)

16 ACRES OF CONTAMINATED SOIL = HWQ OF 10

HWQ=10

**SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES
AND FORMULAS FOR MULTIPLE SOURCE SITES**

		Single Source Sites	
(Column 1) Tier	(Column 2) Source Type	(Column 3) HWQ = 10	(Column 4) HWQ = 100
A Hazardous Constituent Quantity	N/A	HWQ = 1 If Hazardous Constituent Quantity data are complete HWQ = 10 If Hazardous Constituent Quantity data are not complete	> 100 to 10,000 lbs
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	>500,000 to 50 million lbs
C Volume	Landfill	≤ 6.75 million cubic feet ≤ 250,000 cubic yards	> 6.75mil to 675mil cu.ft > 250,000 to 25mil cu.yd
	Surface Impoundment	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu.ft. > 250 to 25,000 cu.yd.
	Drums	≤ 1,000 drums	> 1000 to 100000 drums
	Tanks and non-drum containers	≤ 50,000 gallons	> 50,000 to 5mil gallons
	Contaminated soil	≤ 6.75 mil cubic feet ≤ 250,000 cubic yards	> 6.75mil to 675mil cu.ft >250000 to 25mil cu.yd
	Pile	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu.ft > 250 to 25000 cu. yd
	Other	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu. ft >250 to 25000 cu. yd
D Area	Landfill	≤ 340,000 sq. ft ≤ 7.8 acres	>340000 to 34mil sq.ft. > 7.8 to 780 acres
	Surface Impoundment	≤ 1,300 sq. ft ≤ 0.029 acres	>1300 to 130000 sq.ft. >0.029 to 2.9 acres
	Contaminated soil	≤ 3.4mil sq. ft <u>≤ 78 acres</u>	>3.4mil to 340mil sq.ft. >78 to 7800 acres
	Pile	≤ 1,300 sq. ft ≤ 0.029 acres	>1300 to 130000 sq.ft. >0.029 to 2.9 acres
	Land treatment	≤ 27,000 sq. ft ≤ 0.62 acres	>27000 to 2.7mil sq.ft. >0.62 to 62 acres

Table 1 (continued)

Single source sites		Multiple source sites		
HWQ = 10000	HWQ=1000000	Divisor	Source type	Tier
>10000 - 1mil lbs	>1mil lbs	lbs/1	N/A	A Hazardous Constituent Quantity
>50mil - 5bil lbs	>5bil lbs	lbs/5000	N/A	B Hazardous Wastestream Quantity
>675mil - 67.5bil >25mil - 2.5bil	>67.5bil >2.5bil	cu.ft./675000 cu.yd/2500	Landfill	C Volume
>675000-67.5mil >25000 - 2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Surface Impoundment	
>100000 - 10mil	>10mil	drums/10	Drums	
>5mil-500mil	>500mil	gallons/500	Tanks and non- drum containers	
>675mil-67.5bil >25mil-2.5bil	>67.5bil >2.5bil	cu.ft/67500 cu.yd/2500	Contaminated soil	
>675000-67.5mil >25000-2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Pile	
>675000-67.5mil >25000-2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Other	
>34mil-3.4bil >780-78000	>3.4bil >78000	sq.ft/3400 acres/0.078	Landfill	D Area
>130000-13mil >2.9-290	>13mil >290	sq.ft/13 acres/0.00029	Surface Impoundment	
>340mil-34bil >7800-780000	>34bil >780000	sq.ft/34000 acres/0.78	Contaminated soil	
>130000-13mil >2.9-290	>13mil >290	sq.ft/13 acres/0.00029	Pile	
>2.7mil-270mil >62-6200	>270mil >6200	sq.ft/270 acres/0.0062	Land treatment	

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available to migrate to that pathway. (Note: If **Actual Contamination Targets** exist for groundwater, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3,4,5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type
2. Examine all waste quantity data available for each source. Record constituent quantity and wastestream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6)

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2)

The divisor for the area (sq.ft) of a landfill is 34,000.

The divisor for the area (sq.ft) of a pile is 34.

Wet surface impoundments and tanks and non-drum containers are only sources for which volume measurements are evaluated for the soil exposure pathway.

SI Table 2: HWQ Score for sites

Site WQ Total	HWQ Score
0	0
1* to 100	1**
> 100 to 10,000	100
>10,000 to 1 million	10,000
> 1 million	1,000,000

* If the WQ total is between 0 and 1 round it to 1

** If the hazardous constituent quantity data are not complete, assign the score of 0

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name:

Tennessee Valley Fertilizer

References:

1 & 19 of SI

Sources:

1. Surface Water Samples
2. Raw Materials On Site
- 3.

Source	Haz. Sub	Toxicity	GW Path	SW Path							
			GW Mob	Tox Mob	Per	Tox/Per	Bio Pot	Tox /Per/ Bio	Ecotox	Ecotox/per	Ecotox/Per/Bio
1,2		---	1	---	1	---	0.5	---	---	---	---
1,2		10,000	1	10,000	1	10,000	0.5/5K	5K/5K	---	---	---
2		10	1	10	1	10	5K/1000	5K/5K	10	10	5,000
2		1,000	1	1,000	0.4	400	0.5/6.5	20/100	10,000	4,000	2,000
2		1,000	1	1,000	0.4	400	0.5/6.5	20/100	10	4	2

The groundwater to surface water portion of the surface water pathway was not applicable and is therefore not included above.

On SI Table 4, list the hazardous substances associated with the site detected in groundwater samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the SCDM. Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

Groundwater Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a level II target for that aquifer.

SI TABLE 4: GROUNDWATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Haz. Substance	Bckgrd. Conc.	Toxicity/Mobility	References
Highest Tox/Mob				

SI TABLE 5: GROUNDWATER ACTUAL CONTAMINATION TARGETS

Well ID: Level I: Level II: Pop. Ser.: Ref.:

Sample ID	Haz.Sub.	Conc. PPB	Bench. conc. MCL/MCLG	% of Bench	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
Highest %					Sum of %		Sum of %	

Well ID: Level I: Level II: Pop. Ser.: Ref.

Sample ID	Haz.Sub.	Conc. PPB	Bench. conc. MCL/MCLG	% of Bench.	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
Highest %					Sum of %		Sum of %	

**GROUNDWATER PATHWAY
GROUNDWATER USE DESCRIPTION**

Describe groundwater use within 4 miles of the site: Describe generalized stratigraphy, aquifer, municipal and private wells.

NO KNOWN PUBLIC OR PRIVATE WELLS LOCATED WITHIN THE 4-MILE TARGET RADIUS.

Show calculations of groundwater drinking water populations for each aquifer: Provide apportionment calculations for blended supply systems.
County average number of persons per household:

Lauderdale County is in the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim section is characterized by an alternating landscape of stream valleys and gently rolling hills of slight to moderate relief. The Tennessee Valley Fertilizer site, as well as most of the study area, is underlain by a sequence of carbonate rocks of Mississippian age. The youngest of the carbonate rock units is the Tuscumbia Limestone and the older is the Fort Payne Chert. These geologic units dip to the south and southwest at a rate of about 30 feet per mile.

The Fort Payne Chert includes all rock between the Chattanooga Shale and the Tuscumbia Limestone. The Fort Payne Chert is a thin-bedded microcrystalline siliceous limestone unit with an average of about 50 percent blue-gray to smoky chert. The average thickness of the Fort Payne is about 150 feet. Many solution features are present in the Fort Payne.

The Tuscumbia Limestone formation is also known as the St. Louis or Huntsville Limestone. The general lithology of the Tuscumbia Limestone is a light-gray micritic or bioclastic limestone with white chert nodules common. Dark gray chert is found within the unit but is less common. The average thickness of the Tuscumbia is about 200 feet. Many solution features are present in the Tuscumbia and it is common for these features to be vertically controlled.

All the public water supplies in Lauderdale County and Colbert County that utilize ground water get their ground water from the Tuscumbia-Fort Payne aquifer. The Tuscumbia-Fort Payne aquifer can be considered a partially confined aquifer. The underlying Chattanooga Shale makes the Tuscumbia-Fort Payne aquifer practically impermeable from below, and the presence of a low hydraulic conductivity residual mantle that overlies much of the study area decreases the likelihood of surface contamination entering into the aquifer from above. The Tuscumbia-Fort Payne aquifer is highly susceptible to surface contamination in areas where poorly drained land surfaces reside above the potentiometric surface of the aquifer. The Tuscumbia-Fort Payne aquifer is extremely susceptible to surface contamination in areas where dissolution processes have formed karst surface features such as sinkholes and disappearing streams.

There are no known public or private drinking water wells located within the 4-mile target radius. Since no drinking water wells have been identified in the area, the only targets of the ground water pathway are those that fall into the resources category. *Because of the lack of targets for the groundwater pathway, no analytical data was collected to determine if groundwater has been impacted by the Tennessee Valley Fertilizer site.*

Due to the great amount of years that industry has been present in the community of Sweetwater, it is somewhat likely that the ground water in this community has become contaminated. *No drinking water wells have been identified in the area and therefore, no primary or secondary targets exist that could be exposed to the suspected contamination of the groundwater in the Sweetwater area.*

GROUNDWATER PATHWAY WORKSHEET

Likelihood of release	Data	Score	Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.				
2. POTENTIAL TO RELEASE: Depth to aquifer: feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.	500			
LR =	500			

Likelihood of release

Are any wells part of a blended system? Y N If yes, attach a page to show apportionment calculations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: people x 10 = Level II: people x 1 =	0		
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.	0		
5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles assign 0.	0		
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a groundwater observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	0		
7. RESOURCES: Assign a score of 5 if one or more groundwater resource applies; assign 0 if none applies. <ul style="list-style-type: none"> - Irrigation (5 acre min) of commercial food crops or commercial forage crops - Watering of commercial livestock - Ingredient in commercial food preparation - Supply for commercial aquaculture - Supply for a major or designated water recreation area, excluding drinking water use 	0		
Sum of Targets	0		

SI TABLE 6 (From HRS Table 3-12): Values for Pot. Contamination GW Target Pop.

SI Table 6a: Other Than Karst Aquifers

Population served by wells within distance category													
Dis. from site	Pop.	near well	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. val.
0 to .25		20	4	17	53	164	522	1633	5214	16325	52137	163246	
.25 to .5		18	2	11	33	102	324	1013	3233	10122	32325	101213	
.5 to 1		9	1	5	17	52	167	523	1669	5224	16684	52239	
1 to 2		5	0.7	3	10	30	94	294	939	2939	9385	29384	
2 to 3		3	0.5	2	7	21	68	212	678	2122	6778	21222	
3 to 4		2	0.3	1	4	13	42	131	417	1306	4171	13060	
Nea r	well		Sum =										

SI TABLE 6 (From HRS Table 3-12) Values for Pot. Contamination GW Target Pop.

SI Table 6b: Karst Aquifers

Population served by wells within distance category													
Dis. from site	Pop.	near well	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. val.
0 to .25		20	4	17	53	164	522	1633	5214	16325	52137	163246	
.25 to .5		20	2	11	33	102	324	1013	3233	10122	32325	101213	
.5 to 1		20	2	9	26	82	261	817	2607	8163	26068	81623	
1 to 2		20	2	9	26	82	261	817	2607	8163	26068	81623	
2 to 3		20	2	9	26	82	261	817	2607	8163	26068	81623	
3 to 4		20	2	9	26	82	261	817	2607	8163	26068	81623	
Near well		0											Sum = 0

GROUNDWATER PATHWAY WORKSHEET (concluded)

Waste Characteristics	Score	Data Type																						
8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to groundwater.	10																							
9. Assign the highest groundwater toxicity/mobility value from SI Table 3 or 4.	10K																							
10. Multiply the groundwater toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)																								
<table><tr><td>Product</td><td>WC Score</td></tr><tr><td>0</td><td>0</td></tr><tr><td>>0 to <10</td><td>1</td></tr><tr><td>10 to <100</td><td>2</td></tr><tr><td>100 to <1000</td><td>3</td></tr><tr><td>1000 to <10000</td><td>6</td></tr><tr><td>10000 to <1E+05</td><td>10</td></tr><tr><td>1E+05 to <1E+06</td><td>18</td></tr><tr><td>1E+06 to <1E+07</td><td>32</td></tr><tr><td>1E+07 to <1E+08</td><td>56</td></tr><tr><td>1E+08 or greater</td><td>100</td></tr></table>	Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1000	3	1000 to <10000	6	10000 to <1E+05	10	1E+05 to <1E+06	18	1E+06 to <1E+07	32	1E+07 to <1E+08	56	1E+08 or greater	100		
Product	WC Score																							
0	0																							
>0 to <10	1																							
10 to <100	2																							
100 to <1000	3																							
1000 to <10000	6																							
10000 to <1E+05	10																							
1E+05 to <1E+06	18																							
1E+06 to <1E+07	32																							
1E+07 to <1E+08	56																							
1E+08 or greater	100																							
WC=	10																							

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the groundwater pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

Groundwater Pathway Score:

$$\frac{LR \times T \times WC}{82,500}$$

0

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route:

Label all surface water bodies. Include runoff and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.

The Tennessee Valley Fertilizer site lies within the 100-year flood plain of the Tennessee River Basin at an elevation of approximately 430 feet above mean sea level. Overland drainage exits the site via Sweetwater Creek located on the eastern and southern border of the site. Sweetwater Creek flows south and west from the site for approximately 2,000 feet and then discharges into the Tennessee River.

Once the overland drainage from the Tennessee Valley Fertilizer site enters into the Tennessee River it will travel northwestward, down the Tennessee River for the entire targeted 15-mile downstream surface water pathway. In the 15-mile surface water pathway, the Tennessee River has an average flow of 32,800 million gallons per day (mgd) or 3,170 cubic feet per second (cfs). The lowest flow to which the Tennessee River will decline during 7 consecutive days on an average of once every 2 years of normal flow (7-day Q2) is estimated to be 13,800 cfs. The 7-day Q10 is estimated to be 7,800 cfs.

The 15-mile downstream surface water pathway (SWP) begins and ends on the Tennessee River. *Within the 15-mile surface water pathway, the Tennessee River is classified for water contact sports, fish and wildlife, and public water supply usage. There is one known drinking water intake within the targeted SWP, and it is located approximately 3.5 miles downstream of the site.*

Along the entire targeted overland drainage and surface water pathways there are no known wetlands that could contact water from the site. The land along the banks of the Tennessee River and its intermittent tributaries might be critical to the support of many threatened and endangered terrestrial species. The table below lists the aquatic wildlife that is thought to have a high probability of being exposed to contaminants from the Tennessee Valley Fertilizer site if a substantial amount of contamination was to enter into the surface water pathway:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Alabama cavefish	Endangered	Lauderdale Co. & Colbert Co.
Spotfin chub	Endangered	Lauderdale Co. & Colbert Co.
Cracking pearly mussel	Endangered	Tennessee River
Cumberland monkeyface pearly mussel	Endangered	Tennessee River
Fanshell	Endangered	Tennessee River
Little-wing pearly mussel	Endangered	Tennessee River
Purple cat's paw mussel	Endangered	Tennessee River
Ring pink mussel	Endangered	Tennessee River
Turgid-blossom pearly mussel	Endangered	Tennessee River
White wartback pearly mussel	Endangered	Tennessee River
Yellow-blossom pearly mussel	Endangered	Tennessee River

Since fisheries, endangered aquatic wildlife and one drinking water intake are located within the 15-mile downstream surface water pathway, the following surface water and sediment samples were taken:

Table 1: Sweetwater Creek Surface Water Samples (Reference 19)

Sample ID	Reference ID	Parameter	Results	Units	MCL
AA13548	TVFSW1B	Cadmium	<MDL	Mg/L	0.005
AA13548	TVFSW1B	Chromium	<MDL	Mg/L	0.1
AA13548	TVFSW1B	Copper	<MDL	Mg/L	1.0
AA13548	TVFSW1B	Magnesium	2.84	Mg/L	N/A

AA13548	TVFSW1B	Manganese	<MDL	Mg/L	0.05
AA13548	TVFSW1B	Nickel	<MDL	Mg/L	0.1
AA13548	TVFSW1B	Zinc	<MDL	Mg/L	5.0
AA13548	TVFSW1B	Lead	<MDL	ug/L	15
AA13548	TVFSW1B	Mercury	<MDL	ug/L	2
AA13547	TVFSW1	Cadmium	<MDL	Mg/L	0.005
AA13547	TVFSW1	Chromium	<MDL	Mg/L	0.1
AA13547	TVFSW1	Copper	<MDL	Mg/L	1.0
AA13547	TVFSW1	Magnesium	11.2	Mg/L	N/A
AA13547	TVFSW1	Manganese	10.0	Mg/L	0.05
AA13547	TVFSW1	Nickel	<MDL	Mg/L	0.1
AA13547	TVFSW1	Zinc	<MDL	Mg/L	5.0
AA13547	TVFSW1	Lead	<MDL	ug/L	15
AA13547	TVFSW1	Mercury	<MDL	ug/L	2
AA13546	TVFSW1DG	Cadmium	<MDL	Mg/L	0.005
AA13546	TVFSW1DG	Chromium	0.019	Mg/L	0.1
AA13546	TVFSW1DG	Copper	<MDL	Mg/L	1.0
AA13546	TVFSW1DG	Magnesium	2.93	Mg/L	N/A
AA13546	TVFSW1DG	Manganese	0.076	Mg/L	0.05
AA13546	TVFSW1DG	Nickel	<MDL	Mg/L	0.1
AA13546	TVFSW1DG	Zinc	<MDL	Mg/L	5.0
AA13546	TVFSW1DG	Lead	<MDL	ug/L	15
AA13546	TVFSW1DG	Mercury	<MDL	ug/L	2

TVFSW1B = Background Surface Water Sample at Sweetwater Creek and Veterans Drive

TVFSW1 = Surface Water Sample at Tennessee Valley Fertilizer's Discharge Point into Sweetwater Creek

TVFSW1DG = Downgradient Surface Water Sample at Sweetwater Creek and Power Lines

Table 2: Sweetwater Creek Sediment Samples (Reference 19)

Sample ID	Reference ID	Parameter	Results	Units
AA13549	TVFSED1B	Cadmium	<MDL	ug/g
AA13549	TVFSED1B	Chromium	26.2	ug/g
AA13549	TVFSED1B	Lead	15.0	ug/g
AA13549	TVFSED1B	Magnesium	260	ug/g
AA13549	TVFSED1B	Manganese	346	ug/g
AA13549	TVFSED1B	Nickel	9.97	ug/g
AA13549	TVFSED1B	Zinc	94.6	ug/g
AA13549	TVFSED1B	Mercury	<MDL	ug/g
AA13550	TVFSED1DG	Cadmium	<MDL	ug/g
AA13550	TVFSED1DG	Chromium	22.9	ug/g
AA13550	TVFSED1DG	Lead	25.7	ug/g
AA13550	TVFSED1DG	Magnesium	493	ug/g
AA13550	TVFSED1DG	Manganese	280	ug/g
AA13550	TVFSED1DG	Nickel	12.6	ug/g
AA13550	TVFSED1DG	Zinc	104	ug/g
AA13550	TVFSED1DG	Mercury	<MDL	ug/g

TVFSED1B = Background Sediment Sample at Sweetwater Creek and Veterans Drive

TVFSED1DG = Downgradient Sediment Sample at Sweetwater Creek and Power Lines

In the surface water background sample taken from Sweetwater Creek, the only parameter above the detection limit was magnesium. Magnesium was also found in the surface water sample taken at Tennessee Valley Fertilizer's discharge point into Sweetwater Creek and in the surface water sample taken downgradient of Tennessee Valley Fertilizer. *The discharge sample had concentrations of magnesium higher than three times background..*

Manganese was the only other parameter found above the detection limit in Sweetwater Creek. *Both the Tennessee Valley Fertilizer discharge point sample and the downgradient sample had concentrations of manganese greater than three times background. The discharge and down gradient samples are also above the drinking water MCL's.*

Sediment samples were also taken from Sweetwater Creek upgradient and downgradient of the Tennessee Valley Fertilizer site. None of the parameters tested for were found to be significantly higher downgradient of the site than at the upgradient background sample location. *At both the upgradient and downgradient sample locations, none of the parameters were found to be at concentrations above standard residential screening levels.*

SURFACE WATER PATHWAY

Surface Water Observed Release Substance Summary Table

On SI Table 7, list hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment detecting a hazardous substance at or beyond intake, evaluate the intake as level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCGL benchmark, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

SURFACE WATER PATHWAY

LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION

	Score	Data Type	Ref
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550		
2. POTENTIAL TO RELEASE: Distance to surface water: feet. If sampling data do not support a release to surface water in the watershed, use the table below to assign a score.			
Score			
Distance to surface water <2500 feet	500		
Distance to surface water >2500 feet and			
Site in annual or 10 yr floodplain	500		
Site in 100 yr floodplain	400		
Site in 500 yr floodplain	300		
Site outside 500 yr floodplain	100		
Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2			
LR =	550		

LIKELIHOOD OF RELEASE GROUNDWATER TO SURFACE WATER MIGRATION

	Score	Data Type	Ref
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.			
Note: Evaluate groundwater to surface water migration only for a surface water body that meets all of the following conditions:			
1. A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0.			
2. No aquifer discontinuity is established between the source and the above portion of the surface water body.			
3. The top of the uppermost aquifer is at or above the bottom of the surface water.			
Elevation of top of uppermost aquifer:			
Elevation of bottom of surface water body:			
2. POTENTIAL TO RELEASE: Use the groundwater potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2			
LR =			

**SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET
(CONTINUED)**

DRINKING WATER THREAT TARGETS

<p>Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.</p> <p><u>Intake Name</u> <u>Water Body Type</u> <u>Flow</u> <u>Pop. Served</u></p> <p>TENN. RIVER LARGE RIVER 10-100K <10,000</p> <p>Are any intakes part of a blended system? Y N If yes, attach a page to show apportionment calculations.</p> <p>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8)</p> <p>Level I: people x 10 = Level II: people x 1 = Total =</p>		0		
<p>4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.</p>		1.6		
<p>5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.</p>		0		
<p>6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.</p> <ul style="list-style-type: none"> -Irrigation (5 acre minimum) of commercial food crops or commercial forage crops -Watering of commercial livestock -Ingredient in commercial food preparation -Major or designated water recreation area, excluding drinking water use 		5		
SUM OF TARGETS =		6.6		

**SI TABLE 9 (From HRS 4-14): DILUTION-WEIGHTED POP. VALUES FOR POTENTIAL
CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY**

CFS/Water Body	Pop.	Near intake	Number of people								Pop. Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10000	10001 to 30000	
<10 cfs		20	4	17	53	164	522	1633	5214	16325	
10 to 100 cfs		2	.4	2	5	16	52	163	521	1633	
>100 to 1000 cfs		0	.04	.2	.5	2	5	16	52	163	
>1000 to 10000 cfs		0	.00 4	.02	.05	.2	.5	2	5	16	
>10000 to 100000 cfs		0	0	.00 2	.00 5	.02	.05	.2	.5	16	16
>100000 cfs		0	0	0	.00 1	.00 2	.005	.02	.05	.2	
Shallow ocean zone or Great Lake (depth <20 feet)		0	0	.00 2	.00 5	.02	.05	.2	.5	2	
Moderate ocean zone or Great Lake (depth 20 to 200 feet)		0	0	0	.00 1	.00 2	.005	.02	.05	.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	.00 1	.003	.008	.03	.08	
3 mile mixing zone in quiet flowing river (> 10 cfs)		10	2	9	26	82	261	817	2607	8163	
Nearest intake		0								Sum =	16

SURFACE WATER PATHWAY

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substance detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed release detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substances detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Envir. ID: Sample Type: Level I: Level II: Envir. Val:

Sample ID	Hazardous Substance	Conc. PPB	Bench. Conc. AWQC or AALAC	% of Bench.	Ref.
Highest %					

Envir. ID: Sample Type: Level I: Level II: Envir. Val:

Sample ID	Hazardous Substance	Conc. PPB	Bench. Conc. AWQC or AALAC	% of Bench.	Ref.
Highest %					

**SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT WORKSHEET**

Human Food Chain Threat Targets

Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.													
Fishery Name: TENN. Water Body: LG RIVER Flow: >10K cfs Species: Production: lbs/yr Species: Production: lbs/yr													
Fishery Name: Water Body: Flow: Species: Production: lbs/yr Species: Production: lbs/yr													
FOOD CHAIN INDIVIDUAL 7. ACTUAL CONTAMINATION FISHERIES If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery. 8. If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20. If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:													
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Lowest Flow</th> <th style="text-align: right; border-bottom: 1px solid black;">FCI Value</th> </tr> </thead> <tbody> <tr> <td style="border-bottom: 1px solid black;"><10 cfs</td> <td style="text-align: right; border-bottom: 1px solid black;">20</td> </tr> <tr> <td style="border-bottom: 1px solid black;">10 to 100 cfs</td> <td style="text-align: right; border-bottom: 1px solid black;">2</td> </tr> <tr> <td style="border-bottom: 1px solid black;">>100 cfs, coastal tidal waters, oceans, or Great Lakes</td> <td style="text-align: right; border-bottom: 1px solid black;">0</td> </tr> <tr> <td style="border-bottom: 1px solid black;">3- mile mixing zone in quiet flowing river</td> <td style="text-align: right; border-bottom: 1px solid black;">10</td> </tr> </tbody> </table>	Lowest Flow	FCI Value	<10 cfs	20	10 to 100 cfs	2	>100 cfs, coastal tidal waters, oceans, or Great Lakes	0	3- mile mixing zone in quiet flowing river	10			
Lowest Flow	FCI Value												
<10 cfs	20												
10 to 100 cfs	2												
>100 cfs, coastal tidal waters, oceans, or Great Lakes	0												
3- mile mixing zone in quiet flowing river	10												
FCI Value =	0												
SUM OF TARGETS =		0											

**SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT WORKSHEET**

Environmental Threat Targets

Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.								
<u>Environment Name</u>		<u>Water Body Type</u>		<u>Flow (cfs)</u>				
TENN RIVER		LARGE RIVER		>10,000				
9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table, and assign a factor value for the environment (SI Table 13 and 14).								
<u>Environment Name</u>		<u>Type and value</u>		<u>Multiplier</u>	<u>Product</u>			
10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS								
<u>Flow</u>	<u>Dilution (SI table 12)</u>	<u>Type and Value</u>		<u>Pot Cont.</u>	<u>Product</u>			
>10,000	0.0001	Critical Hab. 100		0.1	0.001			
Sum =								
SUM OF TARGETS =						0		

**SI TABLE 12 (HRS Table 4-13)
SURFACE WATER DILUTION WEIGHTS**

Type of Surface Water Body		Assigned Dilution Weight
Descriptor	Flow Characteristics	
Minimal stream	<10 cfs	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	>100 to 1000 cfs	0.01
Large stream to river	>1000 to 10000 cfs	0.001
Large River	>10000 to 100000 cfs	0.0001
Very large river	> 100000 cfs	0.00001
Coastal tidal waters	N/A	0.001
Shallow ocean zone or Great Lake	Flow N/A; depth less than 20 feet	0.001
Moderate depth ocean zone or Great Lake	Flow N/A; depth 20 to 200 feet	0.0001
Deep ocean zone or Great Lake	Flow N/A; depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

**SI TABLE 13 (HRS TABLE 4-23)
SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES**

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically import areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas inlakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designated as recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
Wetlands see SI Table 14 (SW pathway) or SI Table 23 (Air pathway)	

**SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER
WETLANDS FRONTAGE VALUES**

Total Length of Wetlands	Assigned Values
Less than 0.1 mile	0
0.1 to 1 mile	25
>1 to 2 miles	50
>2 to 3 miles	75
>3 to 4 miles	100
>4 to 8 miles	150
>8 to 12 miles	250
>12 to 16 miles	350

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS				Score																														
14. If any Actual Contamination Targets (drinking water, human food chain, or environmental threat) exist for the watershed, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater.																																		
15. Assign the highest value from SI Table 7 or SI Table 3 for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat																																		
	Substance Value	HWQ	Product																															
Drinking Water Tox/Per	10,000	10	100,000	18																														
Food Chain Tox/Per/Bio	5,000	10	50,000	10																														
Environmental Ecotox/Per/Ecobio	---	10	0	0																														
<table><tr><td>Product</td><td>WC Score</td></tr><tr><td>0</td><td>0</td></tr><tr><td>>0 to <10</td><td>1</td></tr><tr><td>10 to <100</td><td>2</td></tr><tr><td>100 to <1000</td><td>3</td></tr><tr><td>1000 to <10000</td><td>6</td></tr><tr><td>10000 to <1E+05</td><td>10</td></tr><tr><td>1E+05 to <1E+06</td><td>18</td></tr><tr><td>1E+06 to <1E+07</td><td>32</td></tr><tr><td>1E+07 to <1E+08</td><td>56</td></tr><tr><td>1E+08 to <1E+09</td><td>100</td></tr><tr><td>1E+09 to <1E+10</td><td>180</td></tr><tr><td>1E+10 to <1E+11</td><td>320</td></tr><tr><td>1E+11 to <1E+12</td><td>560</td></tr><tr><td>1E+12 or greater</td><td>1000</td></tr></table>				Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1000	3	1000 to <10000	6	10000 to <1E+05	10	1E+05 to <1E+06	18	1E+06 to <1E+07	32	1E+07 to <1E+08	56	1E+08 to <1E+09	100	1E+09 to <1E+10	180	1E+10 to <1E+11	320	1E+11 to <1E+12	560	1E+12 or greater	1000	
Product	WC Score																																	
0	0																																	
>0 to <10	1																																	
10 to <100	2																																	
100 to <1000	3																																	
1000 to <10000	6																																	
10000 to <1E+05	10																																	
1E+05 to <1E+06	18																																	
1E+06 to <1E+07	32																																	
1E+07 to <1E+08	56																																	
1E+08 to <1E+09	100																																	
1E+09 to <1E+10	180																																	
1E+10 to <1E+11	320																																	
1E+11 to <1E+12	560																																	
1E+12 or greater	1000																																	

Surface Water Pathway Threat Scores

Threat	LR	Targets	WC	Threat Score
Drinking Water	550	0	18	0
Human Food Chain	550	0	10	0
Environmental	550	0	0	0
SW Pathway Score				0

SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary)

IF there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substance listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both are less than 100% or all are N/A, evaluate the targets as Level II.

The USDA Soil Survey, indicates that the Tennessee Valley Fertilizer site is underlain by Fullerton series soils. Soils of this type are formed from residuum weathered from cherty limestone. The soils of the Fullerton series are deep, well-drained soils with moderate infiltration, permeability and available water capacity.

There are approximately 75 people working at the Tennessee Valley Fertilizer site. No people live on property immediately adjacent to the site and no daycare facilities were seen within 1/4 of a mile of the site. The nearest School, Brandon Elementary School, is approximately 1/4 of a mile northeast of the site. According to the Alabama 1990 census records, the average number of people living in homes located in the counties of Colbert and Lauderdale is 2.54 residents per household. In the following table, the total population within the target area has been broken down into sub-populations that live within each specified distance radius from the site:

<i>DISTANCE FROM SITE</i>	<i>POPULATION</i>
0 TO 1/4 MILE	253
>1/4 TO 1/2 MILE	208
>1/2 TO 1 MILE	3,212
>1 TO 2 MILES	13,572
>2 TO 3 MILES	15,560
>3 TO 4 MILES	15,455
TOTAL POPULATION	48,250

None of the Tennessee Valley Fertilizer site is considered to be a wetland environment. Within the 4-mile target area and the 15-mile surface water pathway are no known wetlands. It is not known if the Tennessee Valley Fertilizer site is a critical habitat for federally designated endangered or threatened species, but the table below list the terrestrial species that may utilize the land and surface waters located within the specified target areas:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Gray bat	Endangered	Tennessee Valley
Indiana bat	Endangered	Extreme North
Red Wolf	Endangered	Statewide
Backman's Warbler	Endangered	Statewide
Eskimo Curlew	Endangered	Statewide
American Peregrine Falcon	Endangered	Statewide
American Burying Beetle	Endangered	Statewide
Florida Panther	Endangered	Statewide
Red-cockaded woodpecker	Endangered	Statewide
Wood Stork	Endangered	Statewide
Bald Eagle	Endangered	Statewide
Arctic Peregrine Falcon	Threatened	Statewide

The soil exposure pathway probably has posed little threat to the local population. Because of the low likelihood of soil exposure, no soil samples were taken during the Site Investigation. A release of hazardous materials into the air is not suspected.

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I: _____ Level II: _____ Pop: _____

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
Highest %					Sum of %		Sum of %	

Residence ID: _____ Level I: _____ Level II: _____ Pop: _____

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
Highest %					Sum of %		Sum of %	

Residence ID: _____ Level I: _____ Level II: _____ Pop: _____

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
Highest %					Sum of %		Sum of %	

**SOIL EXPOSURE PATHWAY WORKSHEET
RESIDENT POPULATION THREAT**

Likelihood of Exposure	Score	Data Type	Refs
1. OBSERVED RELEASE: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550		
LE =	550		

Targets													
2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3). Level I: people x 10 = Level II: people x 1 = <div>Sum</div> <div>=</div>	0												
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exist assign 0 (HRS Section 5.1.3)	0												
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. <table><tr><td>Number or Workers</td><td>Score</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1 to 100</td><td>5</td></tr><tr><td>101 to 1000</td><td>10</td></tr><tr><td>> 1000</td><td>15</td></tr></table>	Number or Workers	Score	0	0	1 to 100	5	101 to 1000	10	> 1000	15	5		
Number or Workers	Score												
0	0												
1 to 100	5												
101 to 1000	10												
> 1000	15												
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. <table><tr><td>Terrestrial Sensitive Environment Type</td><td>Value</td></tr><tr><td> </td><td> </td></tr></table>	Terrestrial Sensitive Environment Type	Value			0								
Terrestrial Sensitive Environment Type	Value												
6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies. -Commercial agriculture -Commercial silviculture -Commercial livestock production or commercial livestock grazing	0												
Sum of Targets	5												

**SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY
TERRESTRIAL SENSITIVE ENVIRONMENT VALUES**

TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument (air pathway only)	100
Terrestrial habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for the protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding	75
Terrestrial habitat known to be used by State designated endangered or threatened species Terrestrial habitat known to be used by a species under review as to its Federal endangered or threatened status	50
State land designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

**SOIL EXPOSURE PATHWAY WORKSHEET
NEARBY POPULATION THREAT**

Likelihood of Exposure		Data		
		Score	Type	Refs
7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6)	Value 5			
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value 100			
Likelihood of Exposure(SI Table 19)				
LE =		50		

Targets		Data		
		Score	Type	Ref.
8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.		0		
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e., properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS table 5-10). Sum the population values and multiply by 0.1		3.9		
Targets =		3.9		

**SI TABLE 17 (HRS TABLE 5-6):
ATTRACTIVENESS/ACCESSIBILITY VALUES**

Area of Observed Contamination	Assigned Value
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements-for example gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

**SI TABLE (HRS TABLE 5-7):
AREA OF CONTAMINATION FACTOR VALUES**

Total area of the areas of observed contamination (square feet)	Assigned Value
≤ to 5000	5
> 5000 to 125000	20
> 125000 to 250000	40
> 250000 to 375000	60
> 375000 to 500000	80
> 500000	100

**SI TABLE 19 (HRS TABLE 5-8):
NEARBY POPULATION LIKELIHOOD OF EXPOSURE VALUES**

Area of Contamination Factor Value	Attractiveness/Accessibility Factor Value						
	100	75	50	25	10	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

**SI TABLE 20 (HRS TABLE 5-10):
DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT**

Number of people within the travel distance category													
Dis. from site	Pop.		1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. val.
0 to .25	253	0	.1	.4	1.0	4	13	41	130	408	1303	13034	4
.25 to .5	208	0	.05	.2	.7	2	7	20	65	204	652	6517	2
.5 to 1	3212	0	.02	.1	.3	1	3	10	33	102	326	1020	33
Sum =													39

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

Waste Characteristics

10. Assign the hazardous waste quantity score calculated for soil exposure	10																						
11. Assign the highest toxicity value from SI Table 16	10k																						
12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristic score from the table below:																							
<table> <tr> <th>Product</th><th>WC Score</th></tr> <tr> <td>0</td><td>0</td></tr> <tr> <td>>0 to <10</td><td>1</td></tr> <tr> <td>10 to <100</td><td>2</td></tr> <tr> <td>100 to <1000</td><td>3</td></tr> <tr> <td>1000 to <10000</td><td>6</td></tr> <tr> <td>10000 to <1E+05</td><td>10</td></tr> <tr> <td>1E+05 to <1E+06</td><td>18</td></tr> <tr> <td>1E+06 to <1E+07</td><td>32</td></tr> <tr> <td>1E+07 to <1E+08</td><td>56</td></tr> <tr> <td>1E+08 or greater</td><td>100</td></tr> </table>	Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1000	3	1000 to <10000	6	10000 to <1E+05	10	1E+05 to <1E+06	18	1E+06 to <1E+07	32	1E+07 to <1E+08	56	1E+08 or greater	100	
Product	WC Score																						
0	0																						
>0 to <10	1																						
10 to <100	2																						
100 to <1000	3																						
1000 to <10000	6																						
10000 to <1E+05	10																						
1E+05 to <1E+06	18																						
1E+06 to <1E+07	32																						
1E+07 to <1E+08	56																						
1E+08 or greater	100																						
	18																						

Resident population threat score	LR	Targets	WC	Threat Score
(Likelihood of Exposure, question 1; Targets = Sum of questions 2,3,4,5,6)	550	5	18	0.6
Nearby population threat score	LR	Targets	WC	Threat Score
(Likelihood of Exposure, question 7; Targets = Sum of question 8,9)	50	3.9	18	0.04
		Pathway	Score	0.6425

The Tennessee Valley Fertilizer site was originally discovered in order to determine if the site was a source of lead contamination found in the Florence Canal. Analytical surface water and sediment samples taken from Sweetwater Creek did not indicate that lead concentrations greater than background were entering into the surface water pathway from the Tennessee Valley Fertilizer site.

Analytical surface water and sediments samples did indicate that the Tennessee Valley Fertilizer site is responsible for magnesium, manganese and nitrate contamination in Sweetwater Creek. Surface water is not expected to be significantly impacted by these contaminants due to the large volume and flow rate of water within Sweetwater Creek and the Tennessee River.

Based on the current HRS model the I. M. C. Agri Business Rainbow Division (Tennessee Valley Fertilizer) site is not eligible for consideration to be added to the National Priorities List (NPL). Therefore, it is this writers opinion that the Tennessee Valley Fertilizer site should be NFRAPED.

SITE SCORE CALCULATION

S

S(2)

Groundwater Pathway	0	0
Surface Water Pathway	0	0
Soil Exposure Pathway	0.6425	0.4129
Air Pathway	0	0
Site Score		0.3

Comments

NO FURTHER ACTION RECOMMENDED

FROM:

ADEM

ALABAMA



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
1751 CONG. W. L. DICKINSON DRIVE • MONTGOMERY, AL 36130

PRELIMINARY ASSESSMENT

FOR

**I.M.C. AGRI BUSINESS RAINBOW DIVISION
(TENNESSEE VALLEY FERTILIZER)
FLORENCE, LAUDERDALE COUNTY**

EPA ID NO.: AL0001923325

CERCLA REFERENCE NO.: 6699

ADEM



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 ♦ 1751 CONG. W. L. DICKINSON DRIVE 36109-2608
MONTGOMERY, ALABAMA 36130-1463
(334) 271-7700

JAMES W. WARR
DIRECTOR

FOB JAMES, JR.
GOVERNOR

September 30, 1997

Mr. Brian Farrier
CERCLA PA/SI Regional Project Officer
U.S. EPA Region 4
Atlanta Federal Center
61 Forsyth St. SW
Atlanta, Georgia 30303-3104

Facsimiles (334)
Administration 271-7950
Air 279-3044
Land 279-3050
Water 279-3051
Groundwater 270-5631
Field Operations 272-8131
Laboratory 277-6718
Education/Outreach 213-4399

Dear Mr. Farrier:

Enclosed you will find 2 Preliminary Assessment reports for the following:

**I.M.C. AGRI BUSINESS RAINBOW DIVISION
(TENNESSEE VALLEY FERTILIZER)**

DEWBERRY ENGRAVING

Should you have any questions, please do not hesitate to contact our office.

Sincerely,

Jymalyn E. Redmond, Chief
Site Assessment Unit

JER/tpc



Date: September 23, 1997

Prepared by: Keevin M. Smith (Site Investigator)
Site Assessment Unit
ADEM - Special Projects

Site: I. M. C. Agri Business Rainbow Division (Tennessee Valley
Fertilizer)
P. O. Box 158
1 Commerce St.
Florence, AL. 35630 (205) 764-7821
Contact: Larry Larkin-Plant Manager
Lauderdale County

EPA ID No.: AL0001923325

Ref. No.: 6699

~~AFRAP~~ BT
SI Approved
BT 10-24-97

1 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U. S. Environmental Protection Agency and the Alabama Department of Environmental Management (ADEM), a Preliminary Assessment (PA) was conducted at the IMC Agri Business in Florence, AL. The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA/SARA or other action. The scope of the investigation included a review of available file information, a comprehensive target survey, and a site reconnaissance on a comprehensive target survey..

2. SITE DESCRIPTION, SITE HISTORY, AND WASTE CHARACTERISTICS

2.1 Location

I. M. C. Agri Business is located by driving north on Hyw 65 from Montgomery to the town of Decatur. Then traveling in a western direction on Hyw 20 which is a synonymous name for Alt 72 west to the town of Muscle Shoals then driving north on Hyw 43 until arriving at the town of Florence. Then take Hyw 72 east, which is a synonymous name for Tennessee Ave. Take a right off of Tennessee Ave. onto Court St. and go for a about $\frac{3}{4}$ of a mile, then another right onto Veterans Dr. Go approximately $\frac{3}{4}$ of a mile and you will find the facility on the right. (Reference 18)

The IMC Agri Business Site is located in Lauderdale County, in the town of Florence, Alabama—Township 3 South, Range 11 West; Section 13, North $\frac{1}{2}$, Northwest $\frac{1}{4}$; at

latitude 34° 47' 57.42" and longitude 87° 39' 18.11" (Attachment 1). More specifically, the site is approximately a 16 acre parcel of land. (Reference 1; Reference 2).

2.2 Site Description

Lauderdale County has a temperate climate with abundant precipitation well distributed throughout all seasons. Statistically, Lauderdale County receives the most precipitation, 6.1 inches, during the month of February and the least precipitation, 2.0 inches, during the month of October. The normal annual total precipitation for Lauderdale County is 49.5 inches. Runoff in Lauderdale County is less than 26 inches per year and the mean annual lake evaporation is approximately 40 inches. (Reference 3)

For Lauderdale County, the mean annual maximum temperature is approximately 97° F and the mean annual minimum temperature is approximately 9° F. On a monthly average, January is the coldest and July is the warmest. January has an average low temperature of 34° F and July has an average high temperature of 91° F. (Reference 3)

The site is bounded on its northern side by Veterans Dr., to the east is Sweetwater Creek, to the south, the Florence Canal, and to west a small portion of woods. The western part and a portion of the southern part of the facility are fenced, which makes the site practically inaccessible to the public. When the facility is not in use a security guard walks the premise. The only people that are likely to be exposed to any surficial contamination at the site are the workers that work daily at the site. Currently there are approximately 70 to 75 workers employed at the site. (Reference 19; Reference 20)

I. M. C. Agri Business is involved in the production of fertilizer. When Bonnie Temple and I visited the site on August 14, 1997 the facility looked clean as could be expected. We met with Larry Larkin-Plant Manager, Larry Hodge-Environmental Health and Safety, Mark Gay-Assistant Plant Manager, and Mike Kenna-Environmental Manager. Most of the site is floored in asphalt or concrete. All storage tanks are diked by a concrete barrier except for the anhydrous ammonia and propane tanks, both of these are a gas. All tanks are inspected once a year by ultra sound methods and found to be in satisfactory condition. Some stressed vegetation was noted behind the big warehouse and around the pond, which the plant manager, attributes to the application of Roundup. Near the railroad tressel was a small area of stained soil and gravel, which was due to the railroad parking a backhoe on the area. At one time there was a burn pile located on the site. Wooden pallets and cardboard boxes were burned. However that practice has since stooped and the sulfate potash building sits atop the old burn pile. (Reference 19; Reference 20)

Sweetwater Creek borders the site on the East. It has a gravel bottom and water flows year round. The creek appeared clean and free of litter. There is an abandoned PVC pipe on the eastern side of the property. This was used to carry water from a potash ditch to the pond. The potash ditch is no longer there and the pipe is not in use.

There are currently in use approximately 225 feet of lead-lined pipe and a 2500 gal. vat for mixing sulfuric acid. Five spills have occurred at the facility from 1991 to 1996. Proper procedures were taken, appropriate parties were notified, necessary forms filled out and filed with the state of Alabama. This facility produces a byproduct called hydrofluoro silicic acid or known as HFS. For the year 96/97, 537 tons were produced and sold Harcross Chemical who sells to various city water treatment plants. (Reference 20)

When touring the site, the facility was not in operation due to maintenance and conducting repairs. The plant manager said the facility had been down for seven weeks but would start back in operation on August 18, 1997. It was a hot day with the temperature in excess of 90°F, with little wind blowing. However no odors or annoying irritants were present. (Reference 20)

2.3 Operational History and Waste Characteristics

I. M. C. Agri Business is one of the world's leading private enterprise producer and marketer of crop nutrients. The company had undergone a series of name changes since 1909, when the company was first established. The name changed from International Agricultural Corp. to International Minerals and Chemicals Corp., Plant Food Division to International Fertilizer Ink, Rainbow Division to I. M. C. Agri Business, Rainbow Division which is a division of I. M. C. Global Operation Ink. However the sign at the Florence, AL. facility reads "I. M. C. Fertilizer Rainbow Division." (Reference 20)

The Agri Business headquarters address:

I. M. C. Agri Business, Ink
6 Executive Drive
Collinsville, IL 62234
1-800-767-2855 Ex. 442 Contact-Mike Kenna
1-618-346-7451

The Company headquarters is:

I. M. C. Global Operation Ink
2345 Waukegan Rd.
Suit E200
Bannockburn, IL 60015
1-847-607-3000 Contact-Carylin Merrit

International Agricultural Corporation (IAC) was formed June 14, 1909 by three men, Thomas C. Meadows, Oscar L. Dortch and Waldemar A. Schmidtman. The Florence, AL. facility was built between 1909 and 1910. The facility produced fertilizer by what is known as a batch process. By 1964 the process had changed to a granulation process and is still in use today. This plant produces about 140,000 tons of premium granular fertilizer annually. Also it claims the distinction of being the Corporation's oldest

continuously operating production facility. Prior to its beginnings in 1909 as a fertilizer plant, the original building had been used as a flour mill as early as 1860. (Reference 20)

Raw product mostly comes into the facility by railroad. Most of the finished product leaves by truck, very little is sent out by rail. This raw product is housed in large warehouses. Stalls are used to separate the product and the floor is concrete. This raw product is mixed in various concentrations and after a series of distinct steps the granular fertilizer is produced and bagged. (Reference 19)

There are several waste sources present at the site. The following sources were noticed while touring the site. Several drums were located in the truck shop which are used to collect waste lubricants and other products associated with maintenance of machinery. They appeared to be in excellent condition, free from leaks, properly painted and labeled. A pond on the site is used to collect water from the washing of trucks while parked on the truck pad. It is a rectangular impoundment with an area of 9324 sq. ft. The depth is approximately 10 feet. The bottom is composed of rock and clay. The pond should receive large quantities of storm water run off from the facility. (Reference 20)

All water collected on site in ditches or dikes is pumped into the pond and then used back in the production of fertilizer, or in some cases the water is pumped directly from the ditch or low area back into the production of fertilizer. Stormwater runoff is monitored by four outfalls as it leaves the property. According to analytical data the stormwater runoff is impacted by elevated nitrogen levels. (Reference 19; Reference 20; Attachment 14)

3. GROUND WATER PATHWAY

3.1 Hydrogeologic Setting

Lauderdale County is in the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim section is characterized by alternating landscape of stream valleys and gently rolling hills of slight to moderate relief. The I.M.C. Agri Business site, as well as most of the study area, is underlain by a sequence of carbonate rocks of Mississippian age. The youngest of the carbonate rock units is the Tuscumbia Limestone and the oldest is the Fort Payne Chert. These geologic units dip to the south and southwest at a rate of about 30 feet per mile. (Reference 6; Reference 7)

The Fort Payne Chert includes all rock between the Chattanooga Shale and the Tuscumbia Limestone. The Fort Payne Chert is a thin-bedded microcrystalline siliceous limestone unit. The average thickness of the Fort Payne Chert is about 150 feet. Many solution features are present in the Fort Payne. (Reference 5)

The Tuscumbia Limestone formation is also known as the St. Lewis or Huntsville Limestone. The general lithology of the Tuscumbia Limestone is a light-gray micritic or bioclastic limestone with white chert nodules. Dark gray chert is found within the unit but is less common. The average thickness of the Tuscumbia is about 200 feet. (Reference 5)

All the public water supplies in Lauderdale County and Colbert County that utilize ground water get their ground water from the Tuscumbia-Fort Payne aquifer. The Tuscumbia-Fort Payne aquifer can be considered a partially confined aquifer. The underlying Chattanooga Shale makes the Tuscumbia-Fort Payne aquifer practically impermeable from below, and the presence of a low hydraulic conductivity residual mantle that overlies much of the study area decreases the likelihood of surface contamination entering into the aquifer from above. The Tuscumbia-Fort Payne aquifer is highly susceptible to surface contamination in areas where poorly drained land surfaces reside above the potentiometric surface of the aquifer. The Tuscumbia-Fort Payne aquifer is extremely susceptible to surface contamination in areas where dissolution processes have formed karst surface features such as sinkholes and disappearing streams. (Reference 5; Reference 11)

3.2 Ground Water Targets

There are no known public or private drinking water wells located within the 4-mile target radius. Since no drinking water wells have been identified in the area, the only targets of the ground water pathway are those that fall into the resources category, which encompasses future ground water use. (Reference 4)

3.3 Ground Water Conclusions

Due to the numerous years that industry has been present in the community of Sweetwater, it is somewhat likely that the ground water in this community has become contaminated by metals, volatiles, and semi-volatiles. No drinking water wells have been identified in the area and therefore, no primary or secondary targets exist that could be exposed to the suspected contamination of the groundwater in the Sweetwater area. There are no analytical data to represent the fact a release has or has not taken place (Reference 19; Reference 20)

4. SURFACE WATER PATHWAY

4.1 Geomorphologic Setting

The I. M. C. Fertilizer Plant lies within the 100-year flood plain of the Tennessee River Basin at an elevation of approximately 440 to 450 feet above mean sea level (Reference 9). Overland drainage exits the site via Sweetwater Creek located on the east border of the site (Attachment 2). Sweetwater Creek flows south from the site for approximately 1-mile and then discharges into the Tennessee River (Attachment 2).

Once the overland drainage from The I. M. C. Fertilizer site enters into Sweetwater Creek it will travel westward to the Tennessee River and, down the Tennessee River for the entire targeted 15-mile downstream surface water pathway. In the 15-mile surface water pathway, the Tennessee River has an average flow of 32800 million gallons per day (mgd) or 3170 cubic feet per second (cfs). The lowest flow to which the Tennessee River will decline during 7 consecutive days on an average of once every 2 years of normal

flow (7-day Q2) is estimated to be 13800 cfs. The 7-day Q10 is estimated to be 7800 cfs. (Reference 10; Reference 12)

Station Number	7-day, 2-year low flow	7-day, 10-year low flow
03589450	3.2 ft ³ /s	0.9 ft ³ /s
03589452	3.1 ft ³ /s	0.7 ft ³ /s
03589500	10700 ft ³ /s	8650 ft ³ /s

Station #03589450 Lat 34° 48' 24", Long 87° 39' 18" in NW1/4 SW1/4 sec. 12, T 3 S., R. 11 W., Lauderdale County, Hydrologic Unit 06030005, at Union Avenue in Florence, .1 mi from East Florence Park. (Sweetwater Creek),(Reference 12)

Station #03589452 Lat 34° 47' 52", long 87° 39' 18" in NE 1/4 NW 1/4 sec. 13, T. 3 S., R. 11 W., Lauderdale County, Hydrologic Unit 06030005, at railroad trestle, 0.3 mi downstream from union Avenue, and at mile 0.61 in Florence, AL. (Sweetwater Creek) Reference 12)

Station #03589500 Lat 34° 47'13", long 87° 40' 12": in SW ¼ sec. 14, T. 3 S., R. 11W., Lauderdale County, Hydrologic Unit 06030005, at lower end of Patton Island, 700 ft. upstream from O'Neal Bridge on U.S. Highway 72, 1.7 mi upstream from Cypress Creek, 2.7 mi downstream from Wilson Dam, and at mile 256.7. (Tennessee River) Reference 12)

4.2 Surface Water Targets

The 15-mile downstream surface water pathway (SWP) begins and ends on the Tennessee River (Attachment 2). Within the 15-mile surface water pathway the Tennessee River is classified for water contact sports, fish and wildlife, and public water supply usage (Reference 15). There is one known drinking water intake within the targeted SWP, and it is located approximately 3.5 miles downstream of the site (Reference 4; Reference 5). Along the entire targeted overland drainage and surface water pathways there are no known wetlands that could come in contact with water from the site. The I.M.C. Agri Business site, and the land along the banks of the Tennessee River and its intermittent tributaries might be critical to the support of many threatened and endangered terrestrial species (see list of terrestrial species in Section 5.2). The table below lists the aquatic wildlife that is thought to have a high probability of being exposed to contaminants from the I.M.C. Agri Business site if a substantial amount of lead or other contaminant was to enter into the surface water pathway:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Alabama Cavefish	Endangered	Lauderdale Co & Colbert Co.
Cracking Pearly Muscle	Endangered	Tennessee River

Cumberland MonkeyfacePearly Mussel	Endangered	Tennessee River
Fanshell Muscle	Endangered	Tennessee River
Purple Cat'Paw Muscle	Endangered	Tennessee River
Ring Pink Mussel	Endangered	Tennessee River
Turgid-Blossom Pearly Mussel	Endangered	Tennessee River
White Wartback Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Yellow-Blossom Pearly Mussel	Endangered	Tennessee River
Orange Footed-Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Pink Mucket Pearly Mussel	Endangered	Lauderdale Co. Tennessee River
Rough Pigtoe Mussel	Endangered	Lauderdale Co. Tennessee River
Slackwater Darter	Endangered	Lauderdale Co. Tennessee River

(Reference 13; Reference 14)

4.3 Surface Water Conclusion

Fisheries, endangered aquatic wildlife, and one drinking water intake are located within the 15-mile downstream surface water pathway. Stormwater runoff is definitely present at the site with elevated nitrogen levels. A release to surface water has occurred and is still occurring presently. While lead contamination has been identified in the Florence Canal, no samples exist to indicate any contribution from this facility at this time. (Reference 20)

5. SOIL EXPOSURE AND AIR PATHWAY

5.1 Physical Conditions

The USDA Soil Survey indicates that the site is underlain by Fullerton series soils. These soil types formed from residuum weathered from cherty limestone. The soils of the Fullerton series are deep well-drained soils with a moderate infiltration, permeability and available water capacity. (Reference 3)

5.2 Soil and Air Targets

There are approximately 75 people working at the I.M.C Fertilizer site and no people living on properties immediately adjacent to the site. The nearest School, Brandon

Elementary School, is approximately ½ of a mile east of the site (Reference 1; Reference 17). No daycare facilities were seen within 1/2 of a mile of the site during the site reconnaissance. According to the Alabama 1990 census records (Reference 16), the average number of people living in homes located in the counties of Colbert and Lauderdale is 2.54 residents per household. In the following table, the total population within the target area has been broken down into sub-populations that live within each specified distance radius from the site:

<i>DISTANCE FROM SITE</i>	<i>POPULATION</i>
0 – ¼ mile	253
> ¼ -1/2 mile	208
>1/2 – 1 mile	3212
>1 - 2 miles	13572
2 –3 miles	15560
>3 –4 miles	15455
TOTAL POPULATION	32260

None of the I. M. C. Fertilizer site is considered to be a wetland environment. Within the 4-mile target area and the 15-mile surface water pathway are no known wetlands. It is not known if the I. M. C. Fertilizer site is a critical habitat for federally designated endangered or threatened species, but the table below list the terrestrial species that may utilize the land and surface waters located within the specified target areas:

<i>Common Name</i>	<i>Listing</i>	<i>Distribution in Alabama</i>
Gray bat	Endangered	Tennessee Valley
Indiana bat	Endangered	Extreme North
Red Wolf	Endangered	Statewide
Backman's Warbler	Endangered	Statewide
Eskimo Curlew	Endangered	Statewide
American Peregrine Falcon	Endangered	Statewide
American Burying Beetle	Endangered	Statewide
Florida Panther	Endangered	Statewide
Red-cockaded woodpecker	Endangered	Statewide
Wood Stork	Endangered	Statewide
Bald Eagle	Endangered	Statewide
Arctic Peregrine Falcon	Threatened	Statewide

(Reference 13; Reference 14)

5.3 Soil Exposure and Air Pathway Conclusion

The soil exposure pathway will probably pose little threat to the local population. No fumes or odors were present when touring the facility.

SUMMARY AND CONCLUSIONS

Since 1909 I.M.C. Agri Business has been involved in the manufacture of fertilizer. The approximately 16-acre facility located at 1 Commerce St., Florence AL., produces 140,000 tons of fertilizer annually. The main area of concern from the site is in the form of surface water runoff. Ground water contamination could be a problem as well, however without sufficient analytical data a judgement call can not be stated. Soil and air exposure poses little threat to the local population and the environment. Current data indicates that contamination in the form of nitrates is present in stormwater runoff from the site. It is not expected that these nitrates are leaving the site in concentrations significantly elevated enough to have an impact on the surface water intake located on the Tennessee River. However contaminants could impact fisheries and sensitive environments along the surface water pathway.

While there is the potential for impact to groundwater at the site, no monitoring wells exist and additionally groundwater is not used locally for potable supplies.

Based on the concerns noted in the report, we recommend that the I. M. C. Agri Business site be placed in a category of further study with regard to CERCLA and this should be a moderate priority.

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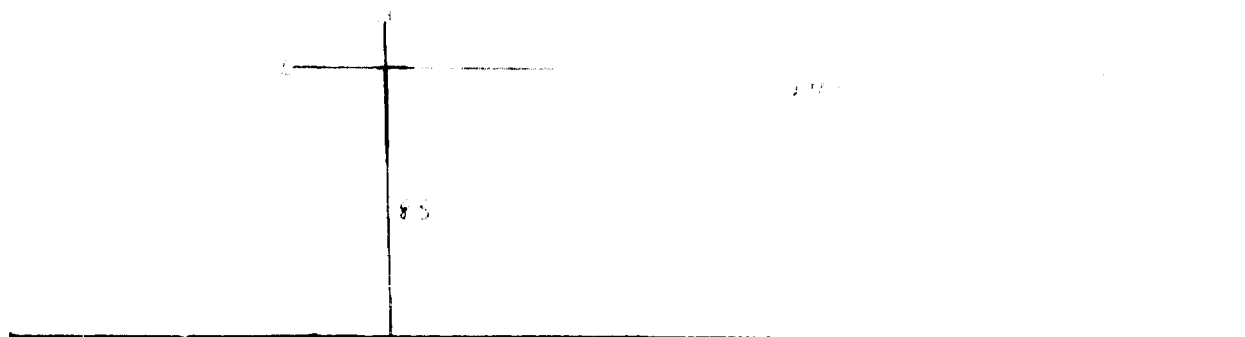
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20. Smith, Keevin M., *Alabama Department of Environmental Management, Special Projects*, Conversations with and information provided by Mr. Larry Larkin-Plant Manager, 14 August 1997.

ATTACHMENTS

Attachment 1	1997 Calculation sheets for Longitude and Latitude
Attachment 2	7.5 Minute Topographic Map for Site
Attachment 3	County map
Attachment 4	Site Diagram
Attachment 5	Endangered Species List (by County)
Attachment 6	Water Classification
Attachment 7	Flood Map – I. M. C. Agri Business
Attachment 8	Population Extract and Maps from Landview II
Attachment 9	Photos
Attachment 10	Storm water flow estimation
Attachment 11	Chemicals used at I. M. C.
Attachment 12	History of I. M. C.
Attachment 13	Results from ultra sound testing
Attachment 14	Storm water discharge monitoring reports
Attachment 15	Spill release reporting forms

ATTACHMENT

1



SITE NAME: I.M.C. Agri Business ^{Rainbow} Division NUMBER: AICOC1923325
MAP NAME: Florence SCALE: 1:24,000 DATUM: 1927

COORDINATES OF LOWER RIGHT HAND CORNER OF 2.5 MINUTE GRID

LATITUDE 34 ° 47 ' 30 " LONGITUDE 87 ° 37 ' 30 "

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2
LI USING ENGINEER'S SCALE (1/60)

Rainbow

SITE NAME: I. M. C. Agri Business Division CERCLIS #: AL0001923325

AKA: I. M. C. Fertilizer Rainbow Division SSID: 6699

ADDRESS: 1 Commerce St.

CITY: Florence STATE: Al. ZIP CODE: 35630

SITE REFERENCE POINT: Northeast Corner of Product Storage Building

USGS QUAD MAP NAME: Florence TOWNSHIP: 3 N(S) RANGE: 11 E(W)

SCALE: 1:24,000 MAP DATE: 1971 SECTION: 12 ^{34 11/4} 13 ^{50 1/4} NW 1/4 NW 1/4

MAP DATUM: (1927) 1983 (CIRCLE ONE) MERIDIAN: _____

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy):

LONGITUDE: 87° 37' 30" LATITUDE: 34° 45' 00"

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 87° 37' 30" LATITUDE: 34° 47' 30"

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 83

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS: $\frac{150}{454} = 0.3304$

A x 0.3304 = 27.42"

C) EXPRESS IN MINUTES AND SECONDS (1' = 60"): 0' 27.42"

D) ADD TO STARTING LATITUDE: 34° 47' 30.00" + 0' 27.42" =

SITE LATITUDE: 34° 47' 57.42"

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 271

B) MULTIPLY (A) BY ^{0.39894} 0.3304 TO CONVERT TO SECONDS: $\frac{150}{376} = 0.39894$

A x 0.3304 = 108.11"

C) EXPRESS IN MINUTES AND SECONDS (1' = 60"): 1' 48.11"

D) ADD TO STARTING LONGITUDE: 87° 37' 30.00" + 1' 48.11" =

SITE LONGITUDE: 87° 39' 18.11"

INVESTIGATOR: Kevin M. Smith DATE: Sept. 11, 1997

ATTACHMENT

2

OVERSIZED

DOCUMENT

ATTACHMENT

3

OVERSIZED

DOCUMENT

ATTACHMENT

4

OVERSIZED

DOCUMENT

ATTACHMENT

5

ENDANGERED SPECIES BY COUNTY LIST

STATE: ALABAMA

	<u>CERTAINTY OF OCCURRENCE</u>	<u>GROUP</u>	<u>STATUS</u>
WOODPECKER, RED-COCKADED (<i>Picoides borealis</i>)	KNOWN	BIRD	E
<u>COUNTY: LAMAR</u>			
MUSSEL, OVATE CLUBSHELL (<i>Pleurobema perovatum</i>)	KNOWN	CLAM	E
MUSSEL, SOUTHERN COMBSHELL (<i>Epioblasma penita</i>)	KNOWN	CLAM	E
MUSSEL, SOUTHERN CLUBSHELL (<i>Pleurobema decisum</i>)	KNOWN	CLAM	E
<u>COUNTY: LAUDERDALE</u>			
BAT, GRAY (<i>Myotis grisescens</i>)	KNOWN	MAMMAL	E
BAT, INDIANA (<i>Myotis sodalis</i>)	POSSIBLE	MAMMAL	E
CAVEFISH, ALABAMA (<i>Speoplatyrhinus poulsoni</i>)	KNOWN	FISH	ECH
-DARTER, SLACKWATER (<i>Etheostoma boschungii</i>)	KNOWN	FISH	TCH
EAGLE, BALD (<i>Haliaeetus leucocephalus</i>)	KNOWN	BIRD	E
-MUSSEL, ORANGE-FOOTED PEARLY (<i>Plethobasus cooperianus</i>)	KNOWN	CLAM	E
-MUSSEL, PINK MUCKET PEARLY (<i>Lampsilis abrupta</i>) (=orbiculata)	KNOWN	CLAM	E
-MUSSEL, ROUGH PIGTOE (<i>Pleurobema plenum</i>)	KNOWN	CLAM	E
MUSSEL, WHITE WARTYBACK PEARLY (<i>Plethobasus cicatriocosus</i>)	KNOWN	CLAM	E
STORK, WOOD (<i>Mycteria americana</i>)	POSSIBLE	BIRD	E
<u>COUNTY: LAWRENCE</u>			
BAT, INDIANA (<i>Myotis sodalis</i>)	POSSIBLE	MAMMAL	E
MUSSEL, PINK MUCKET PEARLY (<i>Lampsilis abrupta</i>)	KNOWN	CLAM	E
STORK, WOOD (<i>Mycteria americana</i>)	KNOWN	BIRD	E
TURTLE, FLATTENED MUSK (<i>Sternotherus depressus</i>)	KNOWN	REPTILE	T
WOODPECKER, RED-COCKADED (<i>Picoides borealis</i>)	KNOWN	BIRD	E

ATTACHMENT

6

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Water Division - Water Quality Program

Chapter 335-6-11 Water Use Classifications For Interstate and Intrastate Waters

Table of Contents

335-6-11-.01	The Use Classification System
335-6-11-.02	Use Classifications

335-6-11-.01 The Use Classification System

(1) Use classifications utilized by the State of Alabama are as follows:

Public Water Supply.....	PWS
Swimming and Other Whole Body	
Water-Contact Sports.....	S
Shellfish Harvesting.....	SH
Fish and Wildlife.....	F&W
Agricultural and Industrial	
Water Supply.....	A&I
Industrial Operations.....	IO
Navigation.....	N
Outstanding Alabama Water.....	OAW

(2) Use classifications apply water quality criteria adopted for particular uses based on existing utilization, uses reasonably expected in the future, and those uses not now possible because of correctable pollution but which could be made if the effects of pollution were controlled or eliminated. Of necessity, the assignment of use classifications must take into consideration the physical capability of waters to meet certain uses.

(3) Those use classifications presently included in the standards are reviewed informally by the Department's staff as the need arises, and the entire standards package, to include the use classifications, receives a formal review at least once each three years. Efforts currently underway through local 201 planning projects will provide additional technical data on certain streams in the State, information on treatment alternatives, and applicability of various management techniques, which, when available, will hopefully lead to new decisions regarding use classifications. Of particular interest are those segments which are currently classified for any usage which has an associated degree of quality

(12) THE TENNESSEE RIVER BASIN

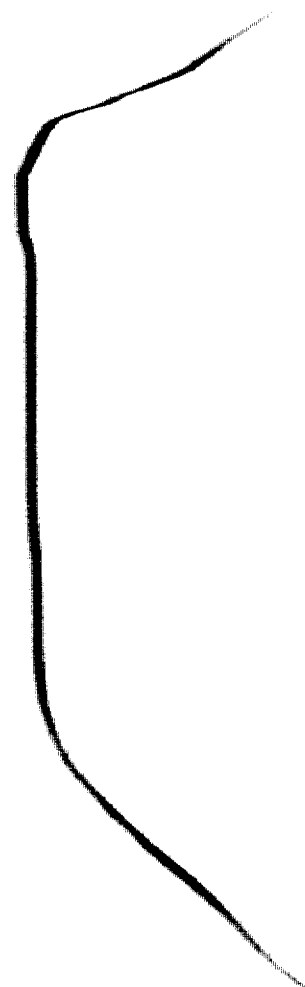
INTERSTATE WATERS

Stream	From	To	Classification
TENNESSEE RIVER Pickwick Lake	Alabama-Tennessee state line	Lower end of Seven Mile Island	PWS/S/F&W
TENNESSEE RIVER Pickwick Lake	Lower end of Seven Mile Island	Sheffield water intake	F&W
TENNESSEE RIVER Pickwick Lake	Sheffield water intake	Wilson Dam	PWS/F&W
TENNESSEE RIVER Wilson and Wheeler Lakes	Five miles upstream of Wilson Dam	Elk River (RM 289.3)	PWS/S/F&W
TENNESSEE RIVER Wheeler Lake	Five miles upstream of Elk River (RM 289.3)	U. S. Highway 31 (see Note 1 this basin)	S/F&W
TENNESSEE RIVER Wheeler Lake	U. S. Highway 31	Flint Creek	PWS/S/F&W
TENNESSEE RIVER Wheeler Lake	Flint Creek	Cotaco Creek	S/F&W
TENNESSEE RIVER Wheeler Lake	Cotaco Creek	Indian Creek	PWS/S/F&W
TENNESSEE RIVER Wheeler Lake	Indian Creek	Flint River	PWS/F&W
TENNESSEE RIVER Wheeler Lake	Flint River	Guntersville Dam	S/F&W
TENNESSEE RIVER Guntersville Lake	Guntersville Dam	Upper end of Buck's Island (see Note 2 this basin)	PWS/S/F&W
TENNESSEE RIVER Guntersville Lake	Upper end of Buck's Island	Roseberry Creek	S/F&W

1992, Effective: February 1, 1993; Amended: Adopted August 18, 1993, Filed August 19, 1993, Effective: September 23, 1993; Amended: Adopted July 20, 1994, Filed July 25, 1994, Effective: August 29, 1994; Amended: Adopted April 22, 1997, Filed April 25, 1997, Effective: May 30, 1997.

ATTACHMENT

7



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

**CITY OF
FLORENCE, ALABAMA
LAUDERDALE COUNTY**

PANEL 4 OF 9

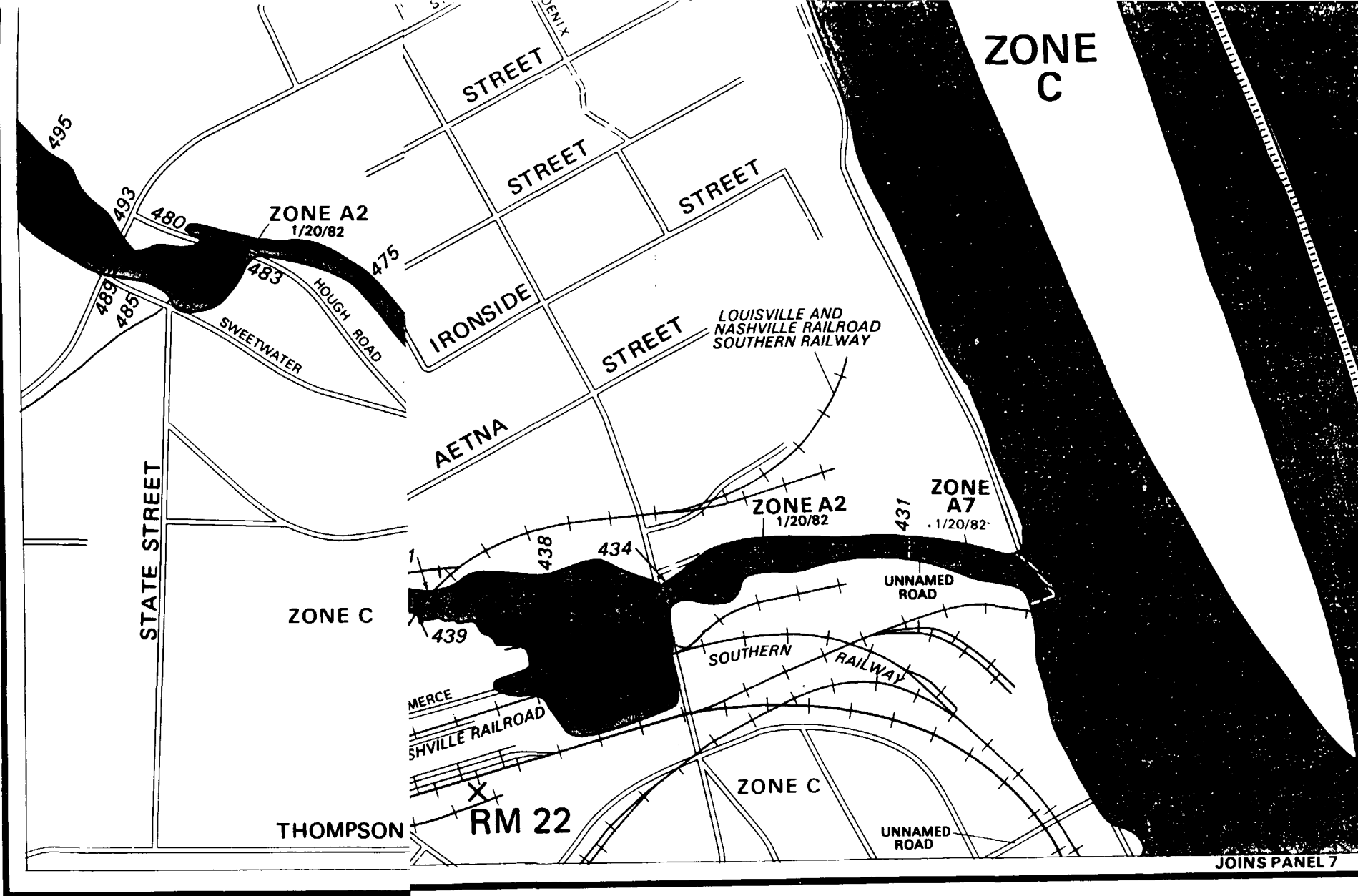
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER
010140 0004 C**

**REVISION DATE:
JANUARY 20, 1982**

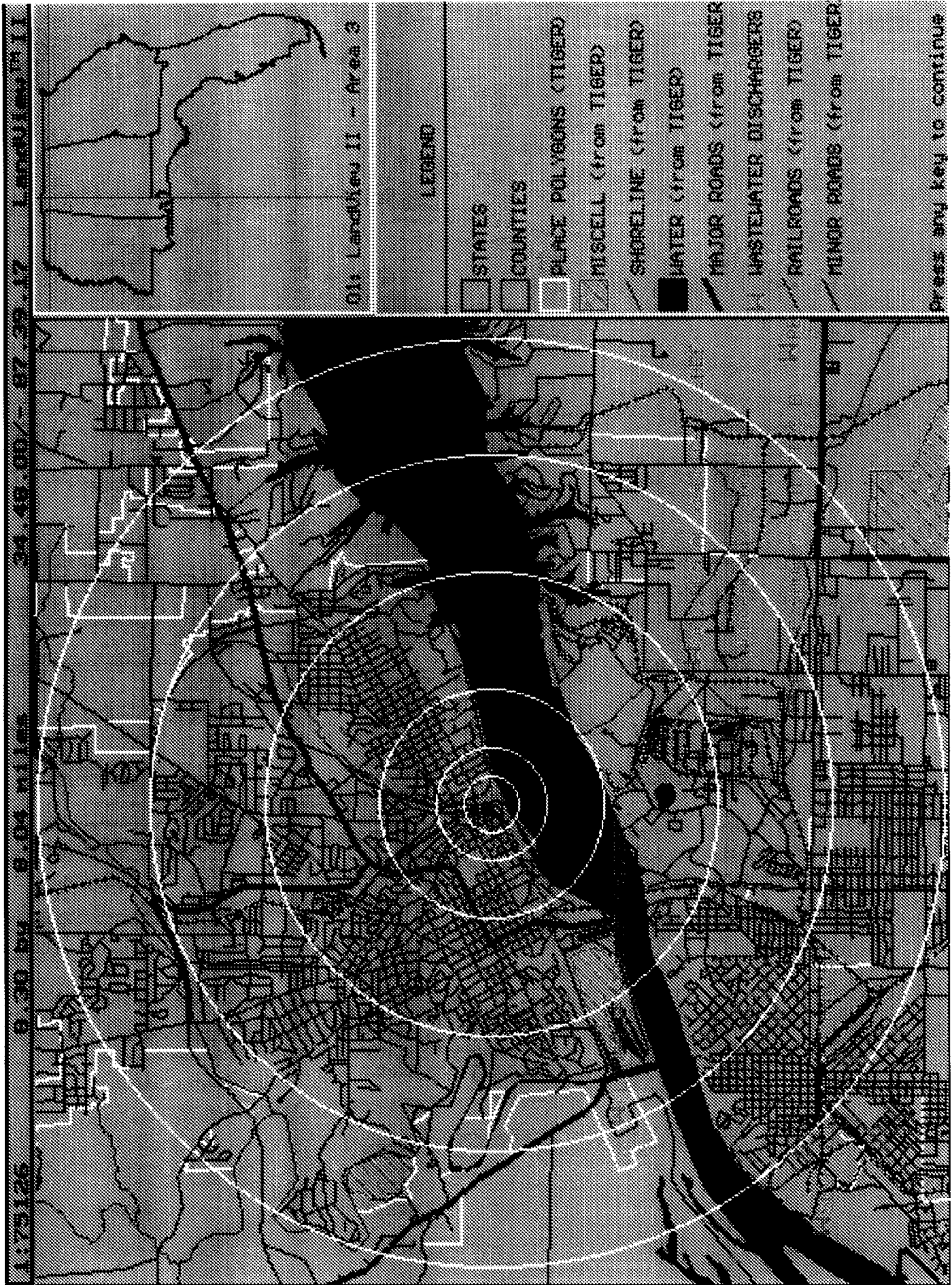


Federal Emergency Management Agency



ATTACHMENT

8



1:25126

0.30 by 0.04 miles

34 48 00 - 87 39 17

Landsea II

Old Landsea II - Area 3

LEGEND

- ☐ STATES
- ☐ COUNTIES
- ☐ PLACE POLYGONS (TIGER)
- ☐ MISCELL (from TIGER)
- ☐ SHORELINE (from TIGER)
- ☐ WATER (from TIGER)
- ☐ MAJOR ROADS (from TIGER)
- ☐ WASTEWATER DISCHARGERS
- ☐ RAILROADS (from TIGER)
- ☐ MINOR ROADS (from TIGER)

Press any key to continue

of sample 0-114 = 100
 $100 \times 2.53 = 253$

POPULATION SUMMARY

LOCATION	:	0.6 mi. radius at 34.800168, -87.654872
# BLOCK GROUPS INCLUDED	:	1
NUMBER OF PERSONS	:	461
NUMBER OF FAMILIES	:	120
NUMBER OF HOUSEHOLDS	:	182
MEDIAN (EST.) HOUSEHOLD INCOME:		14196
AGE 0 THRU 4	:	41
AGE 5 THRU 9	:	38
AGE 10 THRU 19	:	64
AGE 20 THRU 49	:	188
AGE 50 THRU 64	:	47
AGE 65 AND OVER	:	83
WHITE	:	378
BLACK	:	79
INDIAN	:	1
ASIAN	:	2
OTHER RACE	:	1
HISPANIC	:	6
OWNER OCCUPIED	:	105
RENTER OCCUPIED	:	77
PERCENT AGE 0 THRU 4	:	8.9
PERCENT AGE 5 THRU 9	:	8.2
PERCENT AGE 10 THRU 19	:	13.9
PERCENT AGE 20 THRU 49	:	40.8
PERCENT AGE 50 THRU 64	:	10.2
PERCENT AGE 65 AND OVER	:	18.0
PERCENT WHITE	:	82.0
PERCENT BLACK	:	17.1
PERCENT INDIAN	:	0.2
PERCENT ASIAN	:	0.4
PERCENT HISPANIC	:	1.3
PERCENT OTHER RACE	:	0.2
PERCENT OWNER OCCUPIED	:	57.7
PERCENT RENTER OCCUPIED	:	42.3

25 - .5

208

POPULATION SUMMARY

LOCATION	:	1.0 mi. radius at 34.800168, -87.654872
# BLOCK GROUPS INCLUDED	:	8
NUMBER OF PERSONS	:	3673
NUMBER OF FAMILIES	:	989
NUMBER OF HOUSEHOLDS	:	1496
MEDIAN (EST.) HOUSEHOLD INCOME:		12071
AGE 0 THRU 4	:	309
AGE 5 THRU 9	:	301
AGE 10 THRU 19	:	514
AGE 20 THRU 49	:	1459
AGE 50 THRU 64	:	452
AGE 65 AND OVER	:	638
WHITE	:	2921
BLACK	:	727
INDIAN	:	11

0.5 - 1 mile pop

3,212

ASIAN	:	9
OTHER RACE	:	5
HISPANIC	:	19
OWNER OCCUPIED	:	775
RENTER OCCUPIED	:	721
PERCENT AGE 0 THRU 4	:	8.4
PERCENT AGE 5 THRU 9	:	8.2
PERCENT AGE 10 THRU 19	:	14.0
PERCENT AGE 20 THRU 49	:	39.7
PERCENT AGE 50 THRU 64	:	12.3
PERCENT AGE 65 AND OVER	:	17.4
PERCENT WHITE	:	79.5
PERCENT BLACK	:	19.8
PERCENT INDIAN	:	0.3
PERCENT ASIAN	:	0.2
PERCENT HISPANIC	:	0.5
PERCENT OTHER RACE	:	0.1
PERCENT OWNER OCCUPIED	:	51.8
PERCENT RENTER OCCUPIED	:	48.2

POPULATION SUMMARY

LOCATION	:	2.0 mi. radius at 34.800168, -87.654872
# BLOCK GROUPS INCLUDED	:	31
NUMBER OF PERSONS	:	17245
NUMBER OF FAMILIES	:	4324
NUMBER OF HOUSEHOLDS	:	7456
MEDIAN (EST.) HOUSEHOLD INCOME:	:	13952
AGE 0 THRU 4	:	1184
AGE 5 THRU 9	:	1065
AGE 10 THRU 19	:	2374
AGE 20 THRU 49	:	7261
AGE 50 THRU 64	:	2148
AGE 65 AND OVER	:	3213
WHITE	:	13445
BLACK	:	3681
INDIAN	:	45
ASIAN	:	55
OTHER RACE	:	19
HISPANIC	:	83
OWNER OCCUPIED	:	3629
RENTER OCCUPIED	:	3827
PERCENT AGE 0 THRU 4	:	6.9
PERCENT AGE 5 THRU 9	:	6.2
PERCENT AGE 10 THRU 19	:	13.8
PERCENT AGE 20 THRU 49	:	42.1
PERCENT AGE 50 THRU 64	:	12.5
PERCENT AGE 65 AND OVER	:	18.6
PERCENT WHITE	:	78.0
PERCENT BLACK	:	21.3
PERCENT INDIAN	:	0.3
PERCENT ASIAN	:	0.3
PERCENT HISPANIC	:	0.5
PERCENT OTHER RACE	:	0.1
PERCENT OWNER OCCUPIED	:	48.7

1-2 mile pop
13,572

PERCENT RENTER OCCUPIED : 51.3_

POPULATION SUMMARY

LOCATION	:	3.0 mi. radius at	34.800168, -87.654872
# BLOCK GROUPS INCLUDED	:	53	
NUMBER OF PERSONS	:	32805	
NUMBER OF FAMILIES	:	8956	
NUMBER OF HOUSEHOLDS	:	13789	
MEDIAN (EST.) HOUSEHOLD INCOME:	:	18632	
AGE 0 THRU 4	:	2146	
AGE 5 THRU 9	:	1955	
AGE 10 THRU 19	:	4263	
AGE 20 THRU 49	:	13517	
AGE 50 THRU 64	:	4713	
AGE 65 AND OVER	:	6211	
WHITE	:	26577	
BLACK	:	6001	
INDIAN	:	96	
ASIAN	:	101	
OTHER RACE	:	30	
HISPANIC	:	138	
OWNER OCCUPIED	:	8157	
RENTER OCCUPIED	:	5632	
PERCENT AGE 0 THRU 4	:	6.5	
PERCENT AGE 5 THRU 9	:	6.0	
PERCENT AGE 10 THRU 19	:	13.0	
PERCENT AGE 20 THRU 49	:	41.2	
PERCENT AGE 50 THRU 64	:	14.4	
PERCENT AGE 65 AND OVER	:	18.9	
PERCENT WHITE	:	81.0	
PERCENT BLACK	:	18.3	
PERCENT INDIAN	:	0.3	
PERCENT ASIAN	:	0.3	
PERCENT HISPANIC	:	0.4	
PERCENT OTHER RACE	:	0.1	
PERCENT OWNER OCCUPIED	:	59.2	
PERCENT RENTER OCCUPIED	:	40.8_	

2-3 mile pop

15,560

POPULATION SUMMARY

LOCATION	:	4.0 mi. radius at	34.800168, -87.654872
# BLOCK GROUPS INCLUDED	:	73	
NUMBER OF PERSONS	:	48260	
NUMBER OF FAMILIES	:	13352	
NUMBER OF HOUSEHOLDS	:	19785	
MEDIAN (EST.) HOUSEHOLD INCOME:	:	19309	
AGE 0 THRU 4	:	3219	
AGE 5 THRU 9	:	3061	
AGE 10 THRU 19	:	6488	
AGE 20 THRU 49	:	20171	
AGE 50 THRU 64	:	7117	
AGE 65 AND OVER	:	8204	
WHITE	:	38266	

3-4 mile pop

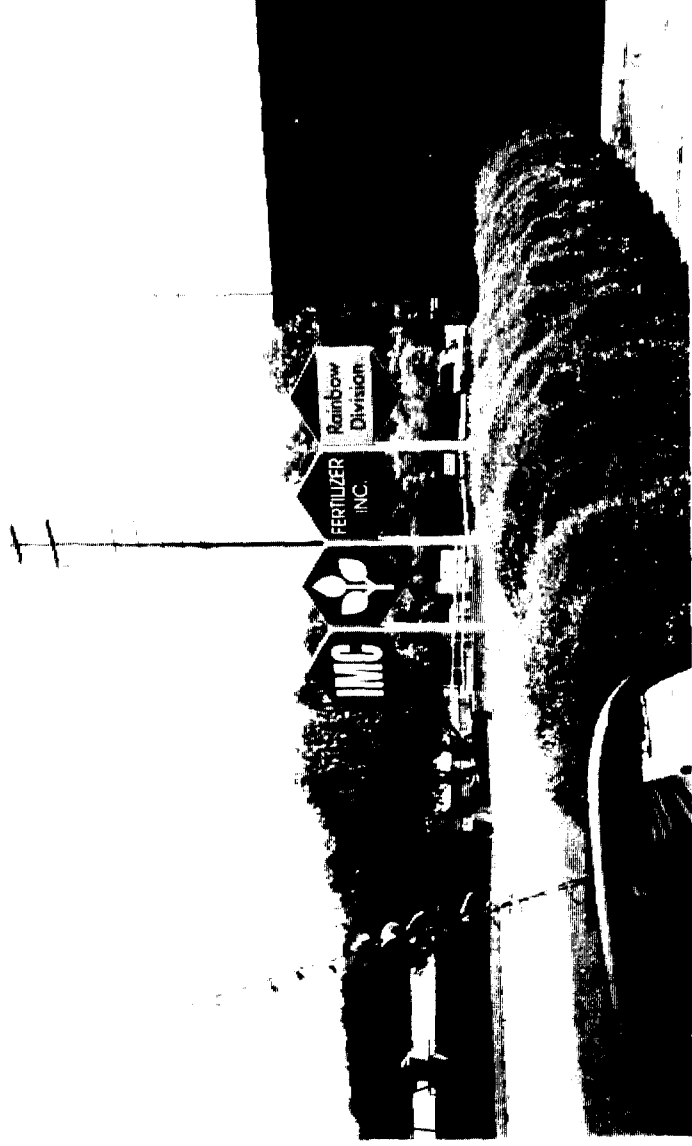
15,455

BLACK	:	9628
INDIAN	:	132
ASIAN	:	193
OTHER RACE	:	41
HISPANIC	:	213
OWNER OCCUPIED	:	12313
RENTER OCCUPIED	:	7472
PERCENT AGE 0 THRU 4	:	6.7
PERCENT AGE 5 THRU 9	:	6.3
PERCENT AGE 10 THRU 19	:	13.4
PERCENT AGE 20 THRU 49	:	41.8
PERCENT AGE 50 THRU 64	:	14.7
PERCENT AGE 65 AND OVER	:	17.0
PERCENT WHITE	:	79.3
PERCENT BLACK	:	20.0
PERCENT INDIAN	:	0.3
PERCENT ASIAN	:	0.4
PERCENT HISPANIC	:	0.4
PERCENT OTHER RACE	:	0.1
PERCENT OWNER OCCUPIED	:	62.2
PERCENT RENTER OCCUPIED	:	37.8_

ATTACHMENT

9

PHOTO #	DESCRIPTION
1.	Sign at I. M. C. Agri Business
2.	Bagmill and office from a distance
3.	Bagmill operation, close-up
4.	Bagmill operation, close-up
5.	Bagmill operation, shot from a different angle
6.	Bagmill operation, shot from a different angle
7.	Granulation building
8.	Granulation building
9.	Stressed vegetation behind the Big Warehouse, (Mr. Larkin stated this was due to the application of Roundup)
10.	Stressed vegetation along side of the fence line next to big warehouse (see above statement)
11.	Coating oil and sulfuric acid tanks
12.	Coating oil and phosphoric acid tanks
13.	Acid cooling and lead tub acid dilution
14.	Pond and empty stainless steel tank
15.	Coating oil tank
16.	Area where sulfuric acid is unloaded and where spill occurred, not a diked or contained area and has a gravel bottom (Reference 20)
17.	Nitrogen tank
18.	Sulfuric acid tank
19.	Parts storage area in Big Warehouse
20.	Stacked fertilizer in Big Warehouse
21.	Drums used to store used lubricants and waste material
22.	Same as above
23.	Stained area where Mr. Larkin said the railroad parked a backhoe
24.	Abandoned PVC pipe that was once used to carry water from the potash ditch to the pond
25.	Shot taken from the Minor Element Storage Building, notice the growth of algae
26.	Drainage pathway from out-fall #008 to Sweetwater Creek. Sweetwater creek is in the background
27.	Sweetwater Creek
28.	City Sewer line and large green hose found in Sweetwater Creek
29.	Raw product storage, note area has concrete floor
30.	Scales and scale house
31.	Out-fall
32.	Out-fall
33.	Out-fall
34.	Out-fall



1

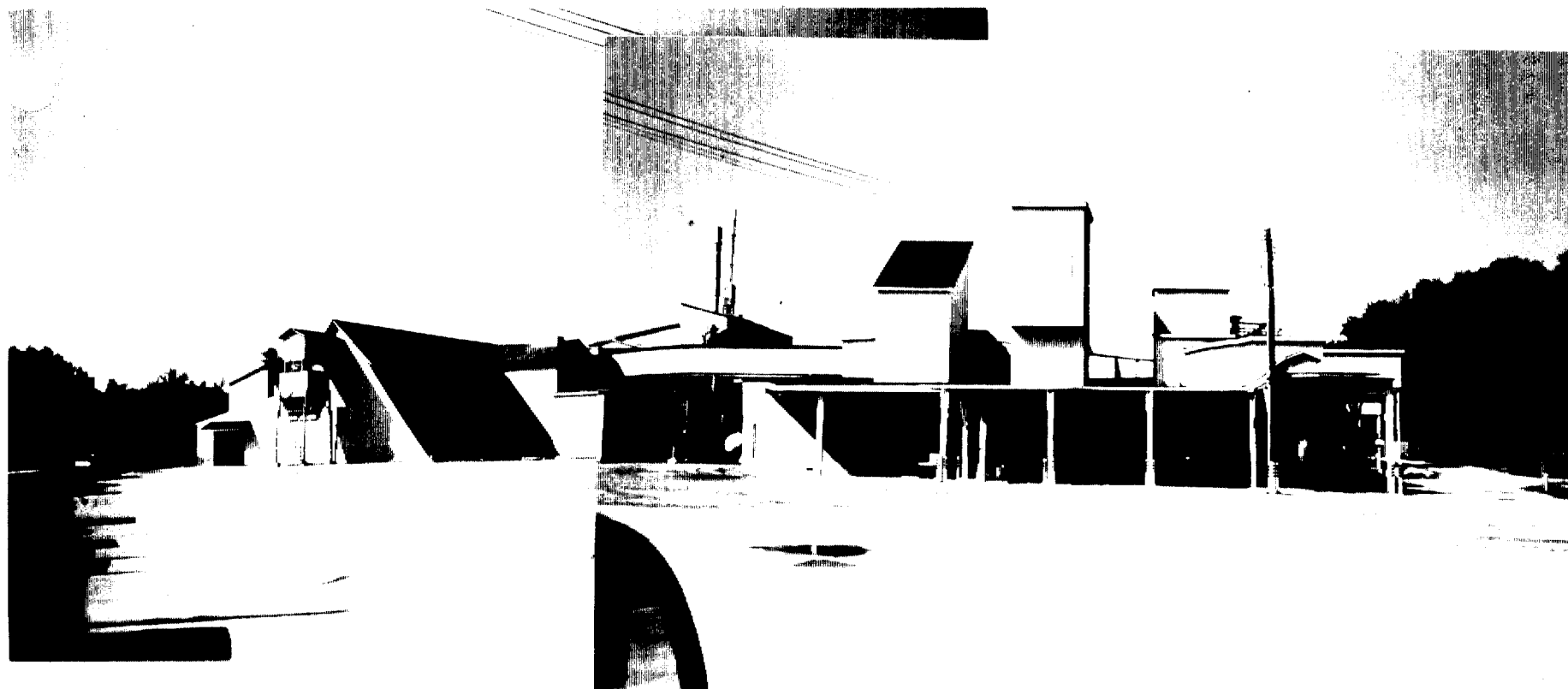


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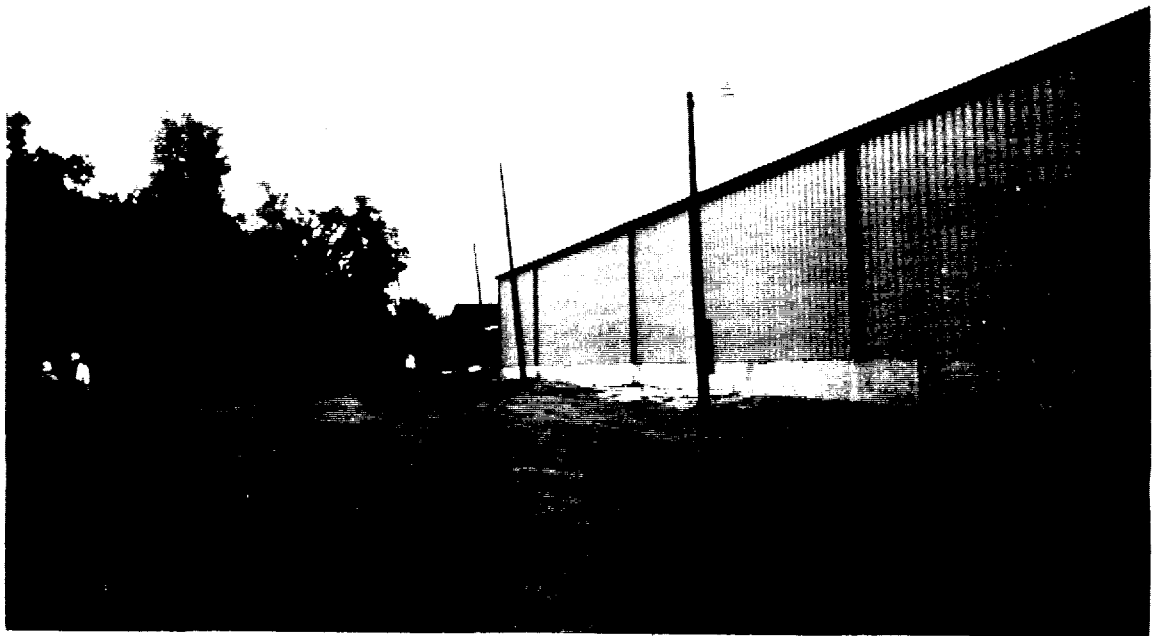
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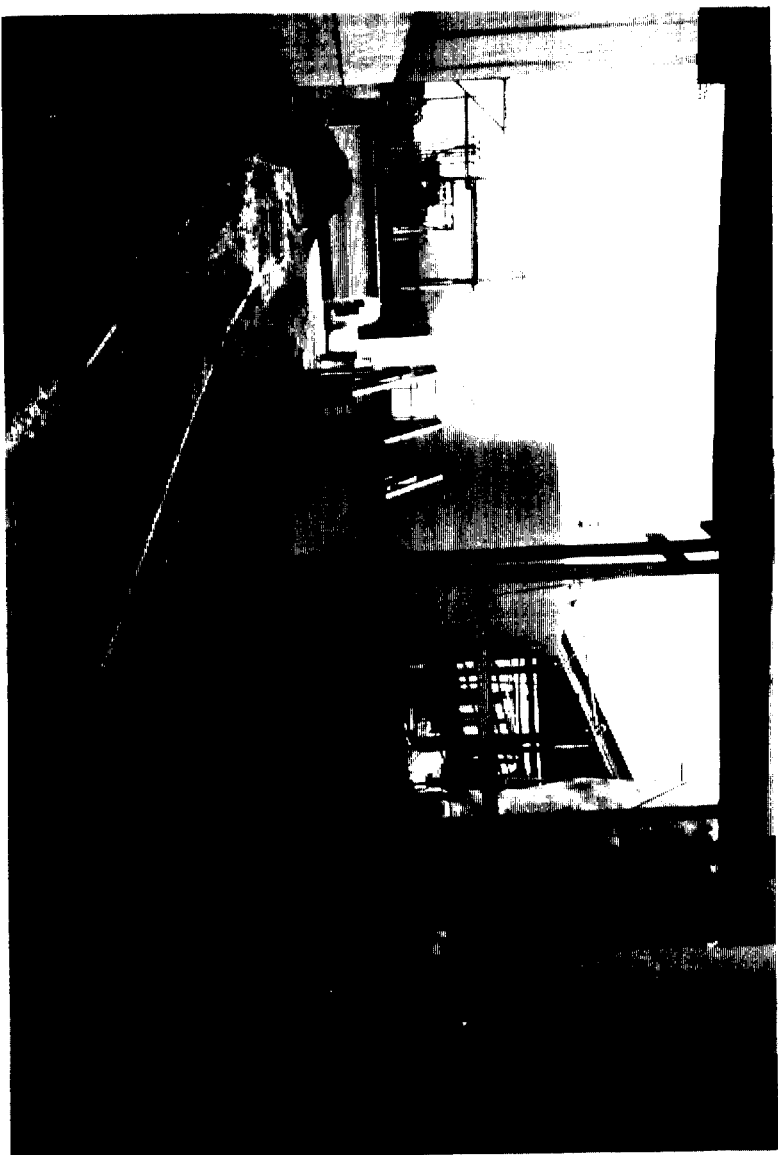
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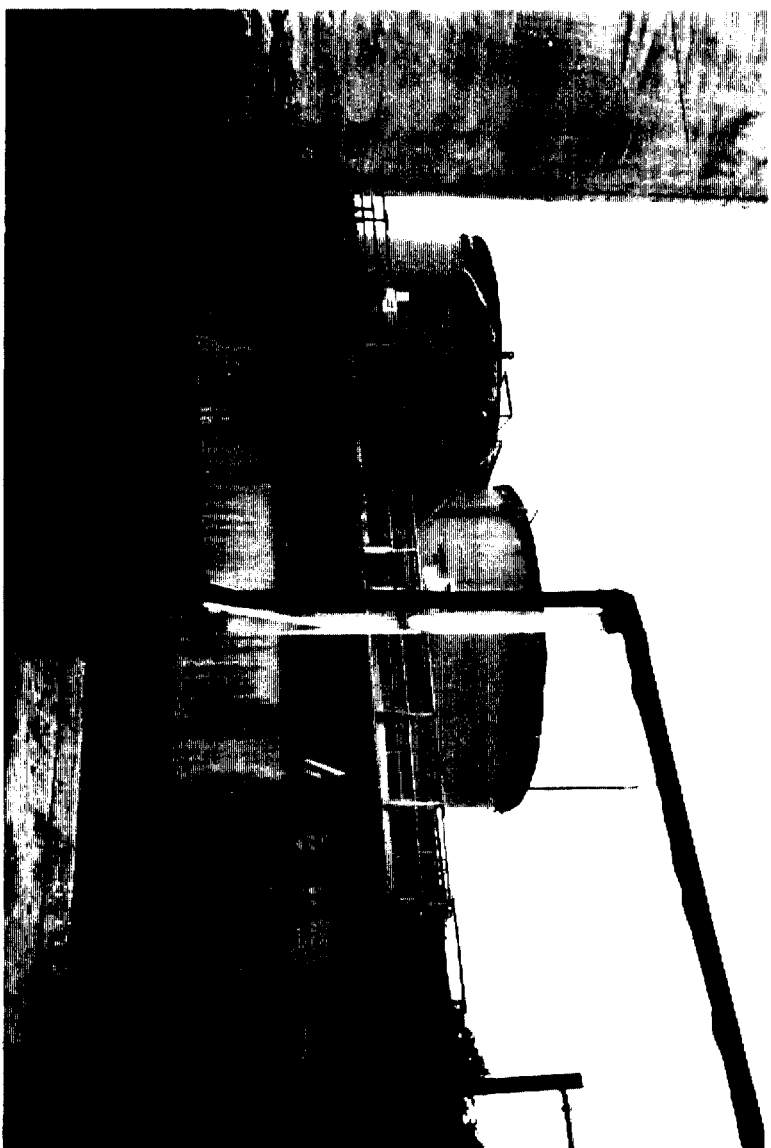
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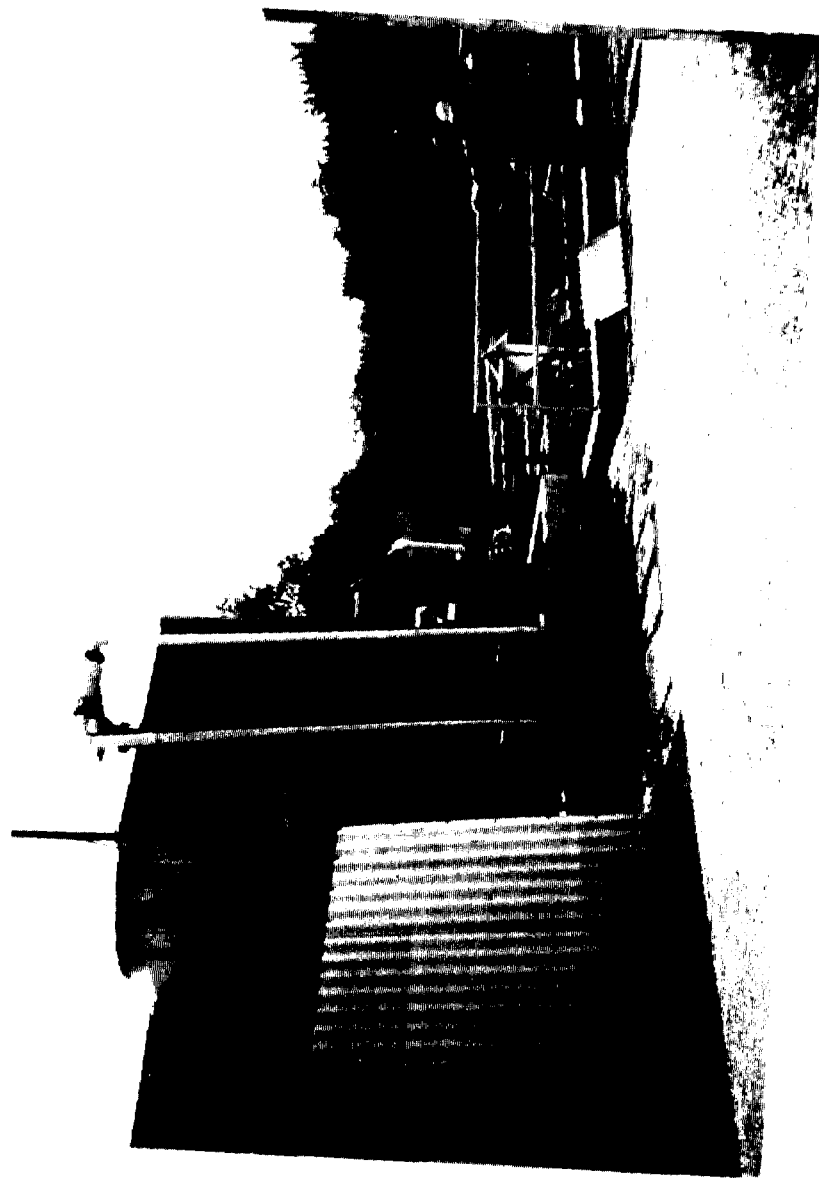
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11



12



13



14



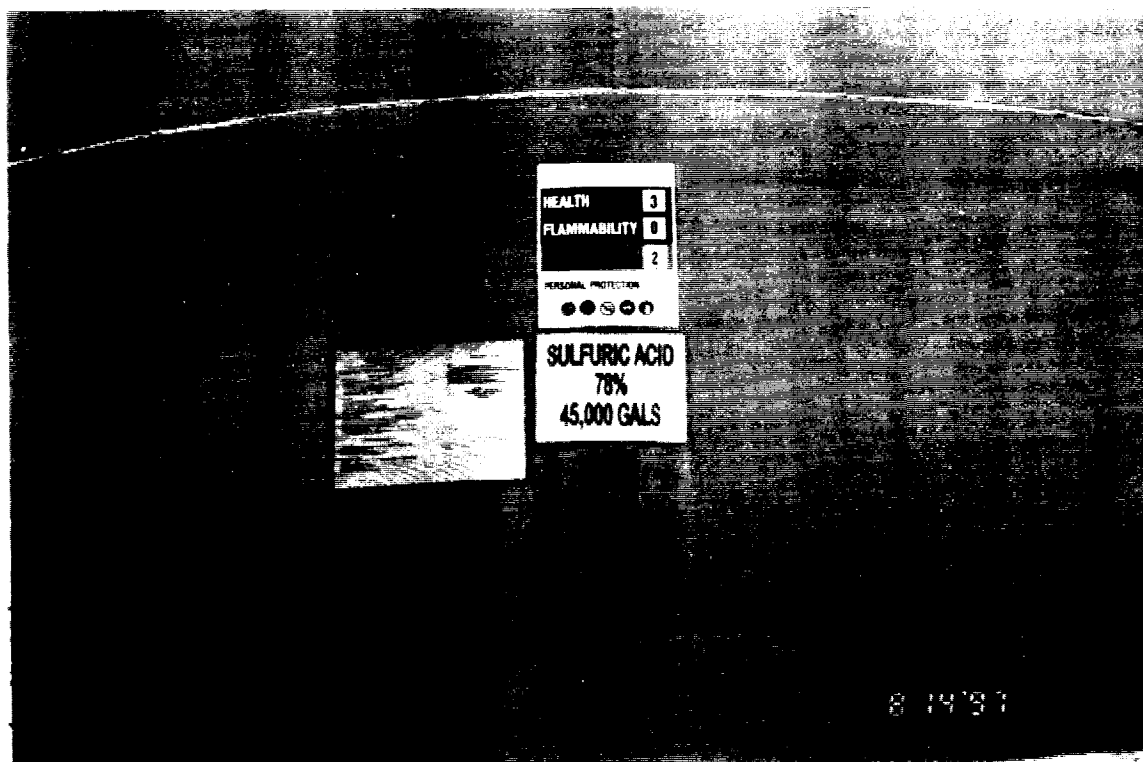
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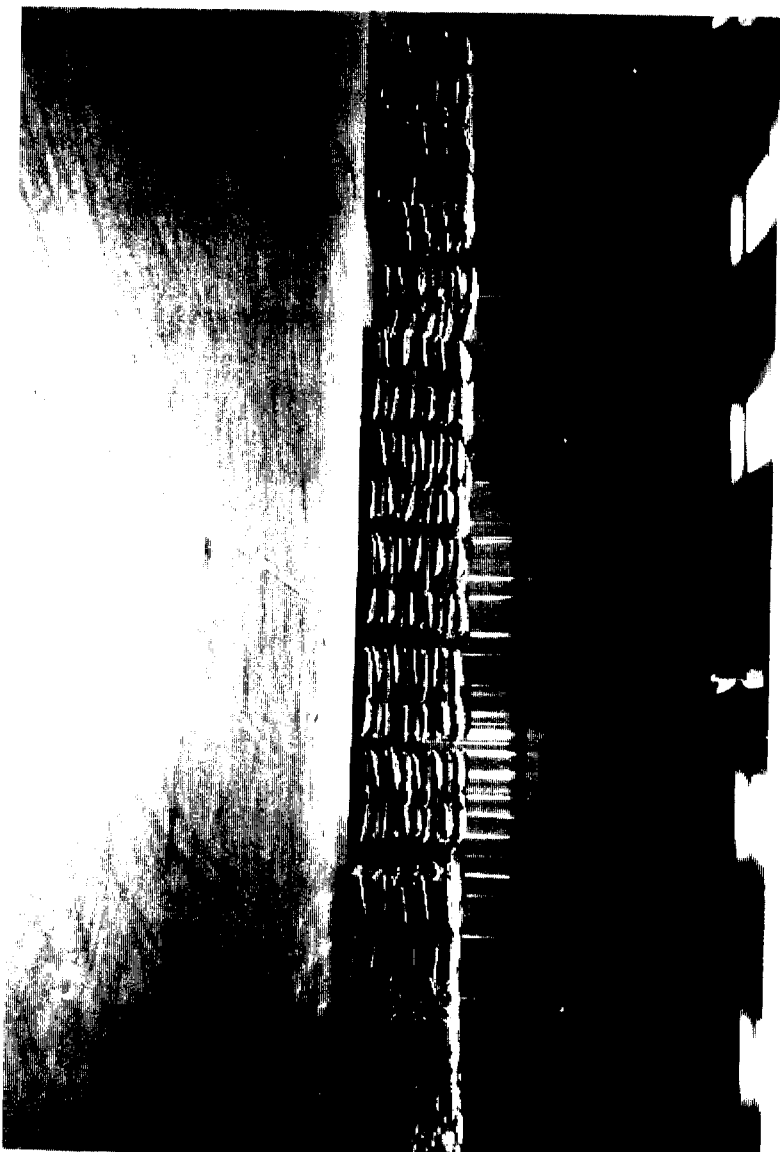


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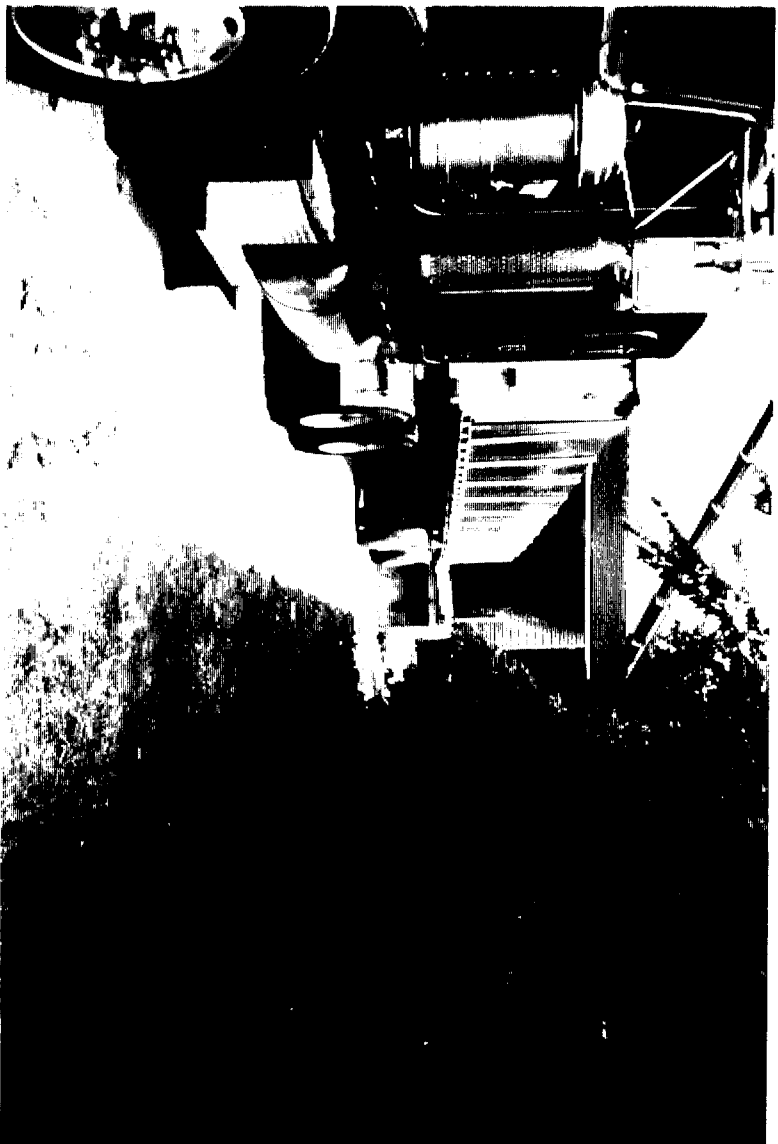
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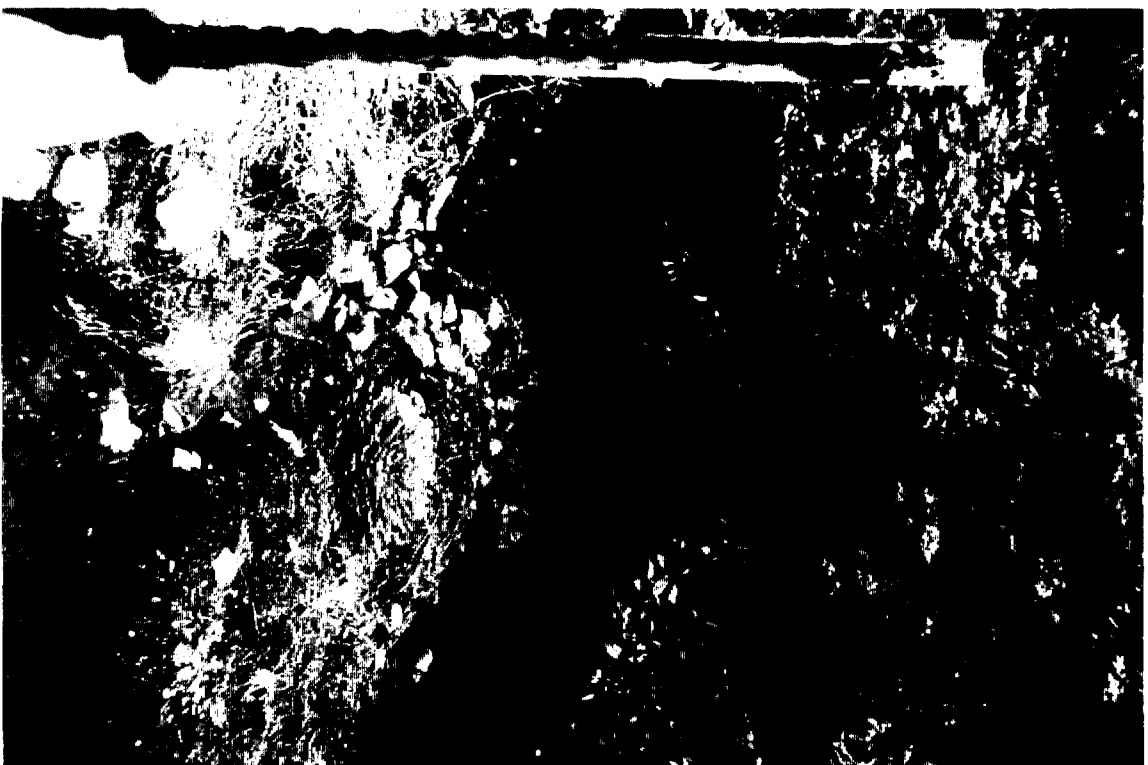
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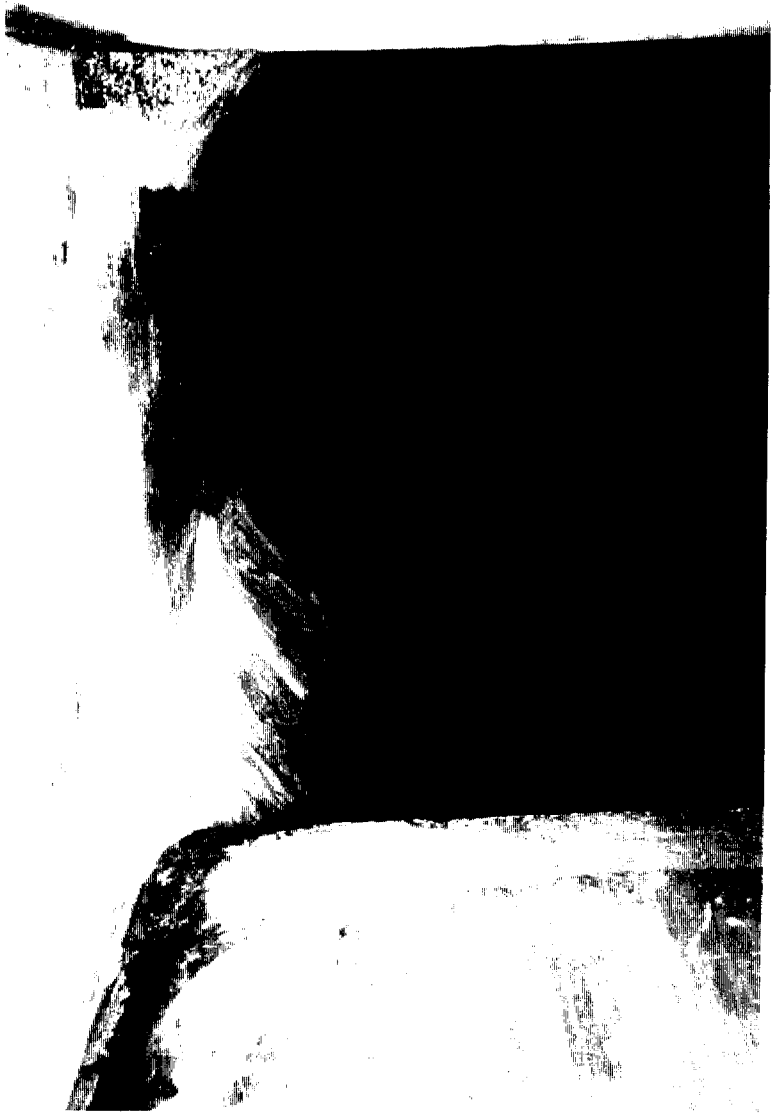
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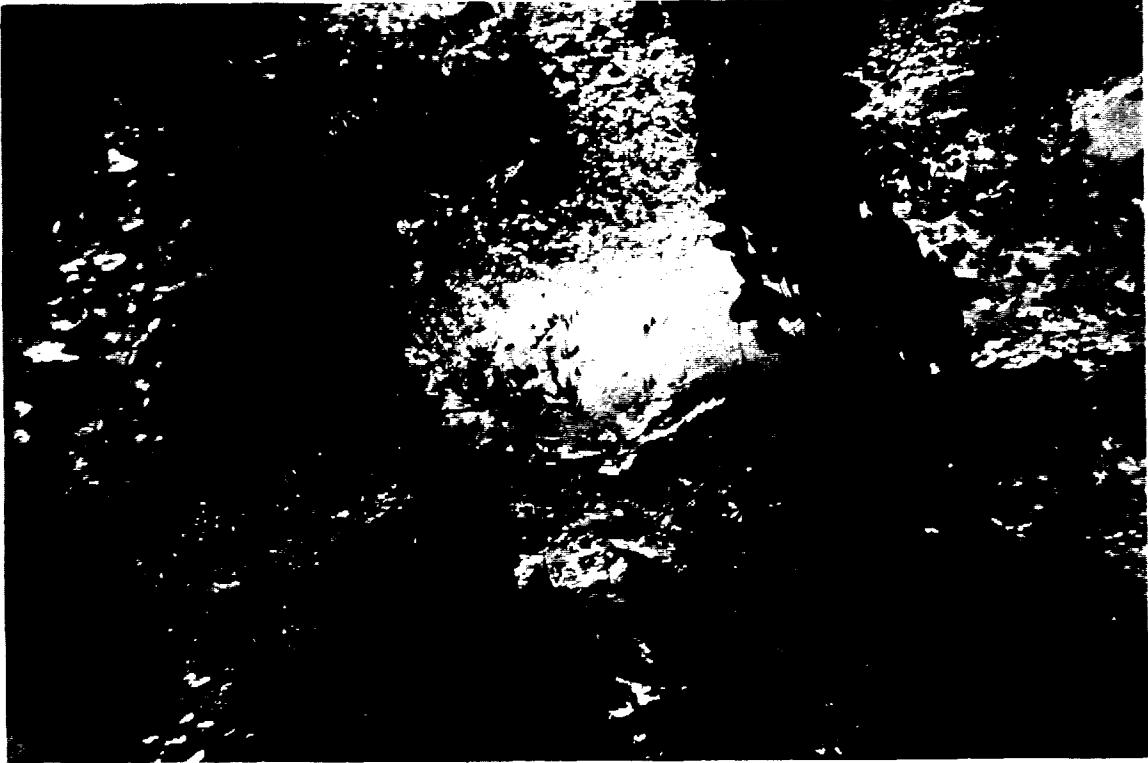


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ATTACHMENT

10

STORM WATER FLOW ESTIMATION

<u>AREA</u>	<u>SQ. FT.</u>	
POND	9,324	AV. RAINFALL \Rightarrow 50 in./yr \Rightarrow 4.17 ft./yr
ASPHALT	117,058	
GRAVEL	88,004	
ROOF	173,397	
CONCRETE	78,594	
GRASS	<u>102,390</u>	
	568,767	\Rightarrow 13.05 _{AC}

$$\text{VOLUME (FT}^3\text{)} = \text{RAINFALL (FT)} \times \text{AREA (SQ. FT.)}$$

ASPHALT

$$\begin{aligned} V &= 4.17 \times 117,058 \\ &= 488,132 \text{ ft.}^3 \\ V &= 488,132 \text{ ft.}^3 \times 0.875 \\ &= 427,116 \text{ ft.}^3 \end{aligned}$$

ROOF

$$\begin{aligned} V &= 4.17 \times 173,397 \\ &= 723,065 \text{ ft.}^3 \\ V &= 723,065 \text{ ft.}^3 \times 0.825 \\ &= 596,529 \text{ ft.}^3 \end{aligned}$$

GRAVEL

$$\begin{aligned} V &= 4.17 \times 88,004 \\ &= 366,997 \text{ ft.}^3 \\ V &= 366,997 \text{ ft.}^3 \times 0.22 \\ &= 80,735 \text{ ft.}^3 \end{aligned}$$

CONCRETE

$$\begin{aligned} V &= 4.17 \times 78,594 \\ &= 327,737 \text{ ft.}^3 \\ V &= 327,737 \text{ ft.}^3 \times 0.875 \\ &= 286,770 \text{ ft.}^3 \end{aligned}$$

GRASS

$$\begin{aligned} V &= 4.17 \times 102,390 \\ &= 426,966 \text{ ft.}^3 \\ V &= 426,966 \text{ ft.}^3 \times 0.25 \\ &= 106,742 \text{ ft.}^3 \end{aligned}$$

TOTAL

$$1,497,892 \text{ ft.}^3$$

ATTACHMENT

11

CHEMICALS USED AT IMC-FLORENCE, AL.

ANHYDROUS AMMONIA
448 NITROGEN SOLUTION(69%AMMONIUM NITRATE, 25% AMMONIA, 6% WATER)
AMMONIUM SULFATE
MONOAMMONIUM PHOSPHATE
DIAMMONIUM PHOSPHATE
NORMAL SUPERPHOSPHATE
PHOSPHORIC ACID
TRIPLE SUPERPHOSPHATE
POTASSIUM CHLORIDE
POTASSIUM SULFATE
POTASSIUM-MAGNESIUM SULFATE
CALCIUM-SODIUM BORATE
ZINC OXIDE
IRON OXIDE
MANGANESE OXIDE
SULFURIC ACID
PHOSPHATE ROCK
SAND
VARIOUS GRADES OF FINISHED N-P-K FERTILIZER
FLUOROSILICIC ACID(PRODUCED AS A BY-PRODUCT FROM PRODUCTION OF
NORMAL SUPERPHOSPHATE)

ATTACHMENT

12

IMC Global Inc.

A Condensed History

- 1909- Business begins as International Agricultural Corporation**
- 1910- Initial Investments in Florida phosphate rock mining operations**
- 1911- Tennessee phosphate properties acquired**
- 1938- Union Potash&Chemical company acquired launching Carlsbad, New Mexico operations**
- 1942- Name changed to International Minerals&Chemical Corporation**
- 1955- Canadian potash search begins**
- 1962- Esterhazy, Canada, potash ore body reached, K1 mine begins operation**
- 1965- World Food Production Conference series begins**
- 1967- K2 potash mine opens in Canada**
- 1971- Phosphate Rock Export Association (PHOSROCK) and Canadian Potash Export Association (CANPOTEX) formed**
- 1974- Phosphate Chemicals Export Association (PHOSCHEM) formed**
- 1976- Production begins at New Wales phosphate chemicals complex in Florida**
- 1980- Uranium recovery operation begins at New Wales**
- 1982- SKMag Export Association formed**
- 1987- IMC Fertilizer Group Inc. created as separate entity**
- 1994- Name changed to IMC Global Inc.**
- 1996- Purchased the Vigoro Corporation(retail facilities and Rainbow renamed IMC AgriBusiness)**

IMC is a major producer of valuable crop nutrients used to feed the ever growing world population. This is accomplished by different divisions within the company. Phosphate rock is mined in Florida. Some of the rock is exported and some is processed into concentrated phosphates. Potash is mined by the Canadian and New Mexico facilities. As with the phosphate rock some potash is exported and some is used in the production of complete mixed fertilizers. With the acquisition of Vigoro in 1996, IMC now has approximately 250 retail facilities located throughout the southeast and midwest. These facilities are able to meet the needs of the local farmers in their community by being able to produce both dry and liquid custom formulations as requested by the customer. The Rainbow division is comprised of four granulation plants and several support warehouse and distribution centers. The granulation plants located at Winston-Salem,NC, Americus,GA, Hartsville,SC, and Florence,AL produce complete Nitrogen-Phosphate-Potash fertilizers. The brands are known as International, Rainbow, and Super Rainbow. These fertilizers also contain essential secondary and minor elements such as magnesium, calcium, boron, and zinc.

A CONDENSED HISTORY OF IMC-RAINBOW FLORENCE, AL.

IMC has been closely associated with the mixed fertilizer business from its beginning in 1909. The original founders of the company sensed the growing demand and understood the necessity for mixed fertilizer and invested a substantial portion of capital early on to purchase a series of mixed fertilizer plants.

The first five of these plants were located at Buffalo, NY; East Point, GA; Houlton, MA; Montgomery, AL; and Florence, AL. The "Mixed Fertilizer Division" as it was initially called grew rapidly in its first 10 years and was renamed the IMC Plant Food Division. By 1925 several other plants had been acquired or constructed and each was producing approximately 20,000 tons annually. Also during this time period some of the plants had constructed acidulation units. These acidulation units produced what is known in the fertilizer business as normal superphosphate. Normal super(16-20%) is produced by combining phosphate rock with sulfuric acid. This was a good source of phosphate for the basic low analysis N-P-K grades of pulverized fertilizer produced in those days.

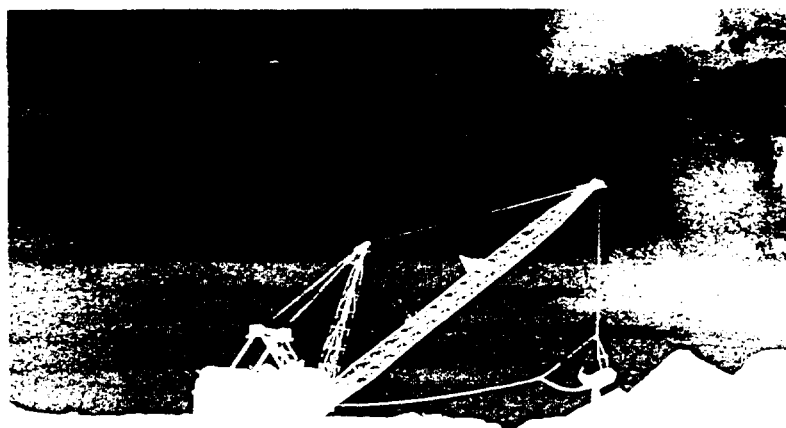
Premium fertilizer was introduced by IAC in 1925 at Montgomery, AL. It was Rainbow designed for cotton. Secondary and minor elements were first recognized as necessary for plant growth.

TVA, during the years after World War II, developed the technology to produce "Granular" fertilizer. Basically, granular fertilizer is chemically combining all the ingredients...N,P,K, secondary and micronutrients into a single granule. Theoretically, each granule is a complete fertilizer within itself. Several small granulation units were installed at some of the midwest and southwest locations during the 1950's and in 1962 the first Super Rainbow product was introduced. This product along with others produced after the initial product of 1925 has created a family of premium fertilizers formulated to meet specific crop needs for higher and more profitable yields.

* In the mid 60's six larger granulation plants were constructed in the southeast. Four of these are still operating today. They are located at Florence, AL; Americus, GA; Hartsville, SC; and Winston-Salem, NC. About the time these plants were constructed the division name was changed from 'Plant Food Division' to "Rainbow Division".

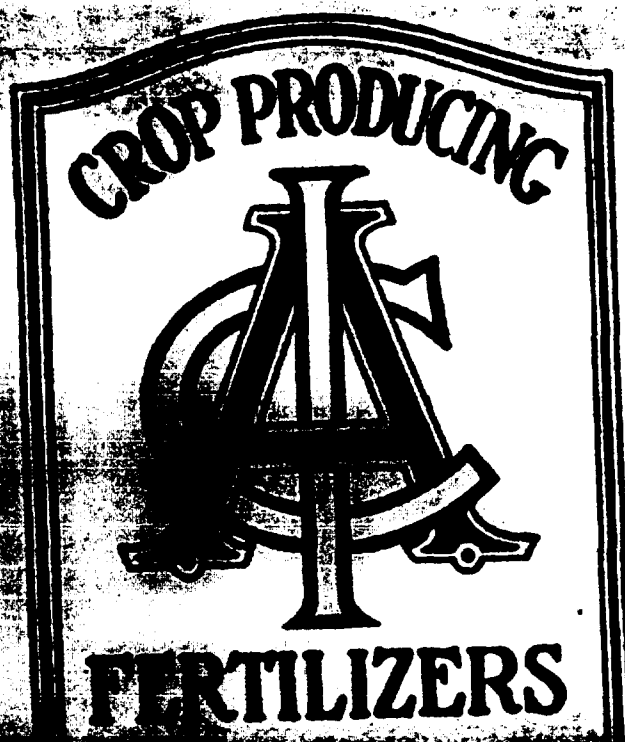
The Florence, AL. plant produces about 140,000 tons of premium granular fertilizer annually. The brand names INTERNATIONAL, RAINBOW, AND SUPER RAINBOW are well known and respected trademarks throughout the agricultural industry. The plant also still operates an acidulation unit which produces about 15,000 tons of normal superphosphate annually. This product is used in the granulation process and the by-product Hydrofluorosilicic acid is used by city water treatment plants for fluoridation purposes.

The Florence facility has about 70 employees dedicated to the continued production of high quality premium fertilizer that the farmer can use to maximize his yields and profits.



Growing with agriculture to feed a hungry world

INTERNATIONAL FERTILIZERS

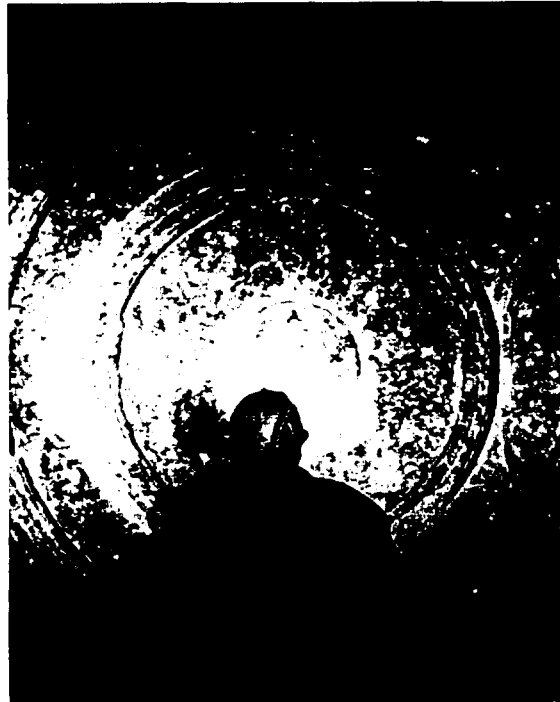


Known as International
Agricultural Corporation from
1909 until 1941, the
company's first logo is
remembered as the beginning
of quality fertilizer products
and worldwide services.

The history of IMC Fertilizer from 1909 . . .

The IMC FERTILIZER of the 1990s ranks as the world's leading private enterprise producer and marketer of crop nutrients. The history of the company is, in reality, the story of how one business has grown and changed over time to meet new needs of world agriculture while retaining the commitment of its founders to be the most responsible, most reliable supplier of food-producing inputs to global agriculture.

The company, operating under its present name as a free-standing, publicly traded corporate entity since 1988, traces its roots back to 1909 with



the creation of the International Agricultural Corporation, one of the pioneers in the U.S. fertilizer business.

In 1941, that company changed its name to International Minerals & Chemical Corporation, the company that became recognized as a major force in supplying phosphate and potash nutrients to world agriculture...the company that developed its fertilizer organization to a position from which it could continue on its own as IMC FERTILIZER GROUP, INC., a move accomplished through an initial public stock offering in February, 1988.

AN IMC CANADA MINER
examines the concentric
circles inscribed on a potash
mine face deep beneath the
prairie of Saskatchewan,
Canada.

An idea takes shape . . .

International Agricultural Corporation (IAC) was formed June 14, 1909 by three men, Thomas C. Meadows, Oscar L. Dortch and Waldemar A. Schmidtman. Meadows, a native of Alabama and an engineering graduate of Vanderbilt University, was recognized as an expert in the fledgling phosphate mining operations in middle Tennessee. Dortch was a native of Tennessee and brother-in-law of Meadows. Schmidtman, originally of Berlin, Germany, was the son of a highly successful Austrian industrialist whose holdings included Kaliwerke Sollstedt, an important German potash mine.

IAC was formed under the laws of New York State. Schmidtman became its first president; Meadows its vice president; and Dortch became the manager of the young company's Tennessee phosphate operations.

A key early step in the new owners' strategy was to acquire Schmidtman's holdings in the German potash mine. The move gave the newly formed corporation a valued access to two major plant foods, phosphate and potash, as both minerals were gaining recognition within the United States agricultural sector in the early 1900s as being vital to increasing production of food and fiber.

Initially, IAC's major motive in acquiring mixed fertilizer plants was to obtain a captive market for its phosphate rock. For many years, phosphate was the only basic fertilizer material produced by IAC.



EARLY PHOSPHATE MINING involved picks and shovels in labor intensive operations. Today, huge machines dig up to 100 tons of rock in a single bite.

Today, that initial single product line has grown to a family of products related directly or indirectly to the company's original customer, agriculture. Among the products produced, marketed or about to be added to IMCF's list of businesses through new expansion ventures, are:

Phosphate Rock	Land management
Potash	Cattle and citrus
Concentrated phosphates	Sulphur
Uranium oxide	Oil and Gas
Mixed fertilizers	

Each contributes, or is expected to add in distinct ways, to the overall success and growth of the company.

A new business founded on 'Rock'

The development of Florida's phosphate rock reserves began with the surveying of that state's wilderness in 1881.

Phosphate deposits were discovered by Captain J. H. Henshaw, a U.S. Army engineer, south of Ft. Meade.

Shortly thereafter, Joseph Hull of Savannah, Georgia, purchased phosphate property about one mile northwest of Mulberry, Florida, where he set up a phosphate prospecting camp at a site called "Prairie". The prospecting was successful and Mr. Hull subsequently developed a mine and washer plant and erected dry storage bins. In 1910, IAC purchased Mr. Hull's Prairie phosphate operations and reserves.

In those days, phosphate mines often were isolated from more established communities. In order to attract and retain workers, mining companies found it necessary to build and to maintain housing accommodations for their employees.

At one time, IAC maintained more than 100 dwellings in the Mulberry, Florida area, a prime example of those so-called "phosphate villages" which peaked in the 1920s and gradually disappeared following World War II.

Meanwhile, other, even more significant, changes continued to alter the phosphate business in Florida.

By 1910, the phosphate industry had graduated from the so-called "pick and wheelbarrow age" to the use of steam-powered locomotives and trains of five-ton dump cars serving a one-and-one half yard steam shovel.

Today, modern mining operations and mile-long trains transport millions of tons of product to domestic markets and to ocean ports such as the company's own Port Sutton terminal on the Gulf of Mexico.



steam shovels of the early mining days.

The modern versions are huge, engineering marvels. A typical dragline, one of IMC's 18 such machines serving its eight rock mines in central Florida, might weigh 4,000 tons and have a boom measuring longer than a football field (300 feet).

Expanding the phosphate line . . .

From its creation in 1909 to 1953, IMC's primary phosphate activity was the mining, drying and grinding of rock, first in Tennessee and later, in Florida. Today, the rock extraction and refining activity also supplies that basic crop nutrient for further processing into concentrated phosphates for agricultural markets worldwide.

In 1927, IMC built its first phosphate chemical plant at Wales, Tennessee, manufacturing tri-sodium phosphate, tetraparasodium phosphate and ammonium phosphate.

Tri-sodium phosphate was in great demand for use in detergents, and, in the 1930s and 1940s, IMC packaged and sold the product from its East Point, Georgia plant until that business was sold in 1941.

Flotation increases productivity . . .

A major technical advance was achieved by IMC in 1929 when engineers developed a revolutionary "flotation" process that resulted in dramatic increases in phosphate mining efficiencies.

The new technology doubled the effective life of rock reserves; it provided a much-needed competitive advantage for the struggling, young company during the depths of the Depression, and it provided the impetus for rapid and more profitable growth until 1939, when IAC became the country's largest phosphate rock producer.

Another, much more visibly dramatic development in the phosphate rock industry has been the use of giant mining machines called "draglines", which dwarf the older

Meanwhile, changes were occurring in Tennessee where phosphate rock was low grade compared with Florida rock. As IMC's Florida operations grew larger, its Tennessee operations continued to decrease until they were discontinued in 1966.

Prior to 1953, IMC had purchased its requirements of concentrated phosphate fertilizers from other producers. That year, the company completed construction of its Bonnie Phosphate Chemical Plant, a facility featuring new technology designed to manufacture concentrated phosphates and phosphate-based animal feed products.

That plant was subsequently sold in 1969, and IMC again bought its chemical requirements from other sources until 1975, when the company began operation of its new, much larger and more efficient production facility...New Wales.

New Wales: state-of-the-art technology . . .

This new complex, located 10 miles southwest of Mulberry, Florida, is described as the largest of its kind in the world, with an annual production capacity of 1.7 million tons of phosphoric acid (P_2O_5 equivalent).

Named after the company's first phosphate operation at Wales, Tennessee,

**CONCENTRATED
PHOSPHATES** were first
produced in Wales, Tennessee,
site of IMC Fertilizer's
operations until 1966 when
the activity was moved to
central Florida.



the plant manufactures phosphoric acid, monoammonium phosphate (MAP), diammonium phosphate (DAP), triple superphosphate (TSP), sulfuric acid and animal feed ingredients.

New Wales is a modern chemical complex. It includes a number of large-capacity production units that provide IMC with the widest possible product mix, and do it more efficiently than any other company in the industry.

For example, the company manufactures its own sulfuric acid in five plants at New Wales. Sulfuric acid is one of the materials required to process phosphate rock into phosphate chemicals, and New Wales converts up to 1.5 million tons of sulfur a year into the acid form to supply the facility's production requirements.

As such, the company is a major user of sulphur, a fact that led to its 1989 investment in a joint sulphur development venture off the Gulf Coast of Louisiana.

Unlocking energy for nuclear power . . .

A highly efficient uranium oxide recovery plant at New Wales utilizes the element's presence which was first identified during the 1940s in the phosphate deposits of central Florida.

With the encouragement and assistance of the Atomic Energy Commission, IMC built and successfully operated a small scale recovery plant to extract uranium from phosphoric acid in the 1950s.

While that venture never reached practical commercial levels, IMC engineers remained alert for potential development as the market for uranium grew with the introduction of nuclear power plants. When market conditions became favorable in the late 1970s, the company reacted by building a technically advanced processing plant at New Wales.

Completed in 1980, the plant has an annual production capacity of approximately 2.2 million pounds of U308 (yellow cake uranium oxide), which is marketed to major

**NEW WALES CHEMICAL
COMPLEX**, largest plant of its
kind in the world, produces a
full range of quality products
for domestic and world
markets.



utility companies for upgrading into enriched fuel for use in nuclear power plants.

A private doorway to world markets . . .

The company has owned and operated its own ocean shipping terminal at Port Sutton near Tampa, Florida since 1964. With excellent access to the Gulf of Mexico, the facility has dockside drying and storage for rock, chemicals and animal feed products.

Port Sutton's modern product handling systems can load DAP (diammonium phosphate) into all types of ships and barges at a rate of up to 2,500 tons per hour. The port also has dockside drying capabilities and storage for both wet and dry rock; storage for phosphate chemicals and for other materials, including ammonia from the company's Sterlington, Louisiana facility.

Managing land for future operations . . .

As part of its long-range planning process, IMC owns or leases over 130,000 acres of phosphate reserve property in central and south Florida, held in anticipation of future mining requirements well into the 21st Century.

In a strategic program to utilize that land prior to its being mined, IMC formed a wholly owned subsidiary, IMC Development Corporation (IMCD), in 1971 to manage the resource as an agricultural enterprise. IMCD currently has about 3,300 acres of producing citrus, vegetable crops and other products. It also operates a 17,000-acre cattle ranch with an average herd of about 5,000 animals.

Since its formation, IMCD also has managed several successful real estate developments involving, among

other things, land that had been reclaimed following mining operations.

Becoming basic in potash . . .

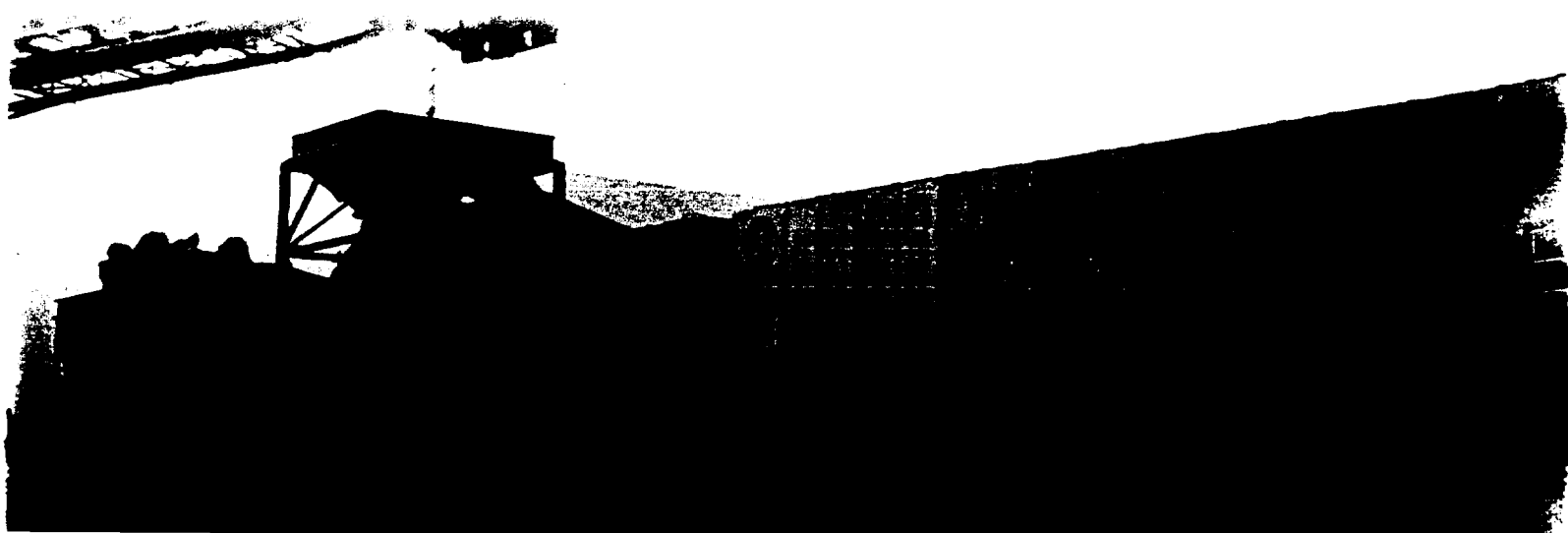
With the formation of the original company in 1909, the three incorporators, Meadows, Dortch, and Schmidtman, anticipated that their newly formed corporation, by virtue of part ownership in a German potash mine, would have a ready supply of potash to mix with its acid phosphate and purchases of nitrogen. Changing political conditions eventually demonstrated the need for the company to be self-sufficient in potash, with reliable domestic production capability and long-term reserves.

The company moved to fill that need in 1940 when it began operating its first potash mine near Carlsbad, New Mexico.

IMC's entry into domestic potash production came as the result of a close relationship with Union Potash Company, a producer which had been searching for potash in the Carlsbad area for some time.

In 1937, IMC advanced \$100,000 to Union Potash Company. In return, the company received options, including the right to examine Union's potash ore studies. Based on that test data, IMC made additional investments to sink the first shaft and to build the processing plant (Union Potash Company subsequently was merged into International Agricultural Corporation.)

Potash is found near Carlsbad in beds from 500 to 1200 feet below the surface. The beds are from 5 to 12 feet thick. Mining is conventional—that is, drilling, undercutting and blasting. The company has mineral rights on over 32,000 acres, and currently mines two forms of potash-bearing ore: langbeinite and sylvinite from which the following products are produced: muriate of potash;



sulphate of potash; sulphate of potash-magnesia (Sul-Po-Mag®) and feed grade potassium products.

Current production capacity of the Carlsbad operation is about one million tons of product, compared with the first year of operation at Carlsbad, when 50,000 tons were produced...just in time to help meet the demand surge when potash imports ceased as result of World War II.

Although the potash produced by IMC at Carlsbad has been marketed primarily as an agricultural plant food product, the company also has met other non-agricultural markets over the years. One such example was the production of magnesium chloride in the 1940s. The product was used to manufacture lightweight magnesium metal at a U.S. government-owned and IMC-operated magnesium plant at Austin, Texas.

IMC earned one of it's country's coveted Army/Navy "E" awards, presented in recognition of its war efforts at the Carlsbad and Austin facilities.

Over its 50 years of operation, IMC's Carlsbad mine has earned recognition as an industry innovator and leader. Among the numerous technical innovations credited to the operation were the first use of heavy media process for potash refining in the U.S., first and only potash operation using flotation as a process for langbeinite ore and the first commercial use of the safer ammonium nitrate as a blasting agent in the U.S. potash industry.

Opening a new frontier on the Canadian prairie . . .

IMC significantly expanded its involvement in potash production in the early 1960s when the company

completed a five-year engineering project to become the first to successfully reach and mine that nutrient from deep beneath the prairies of eastern Saskatchewan, Canada.

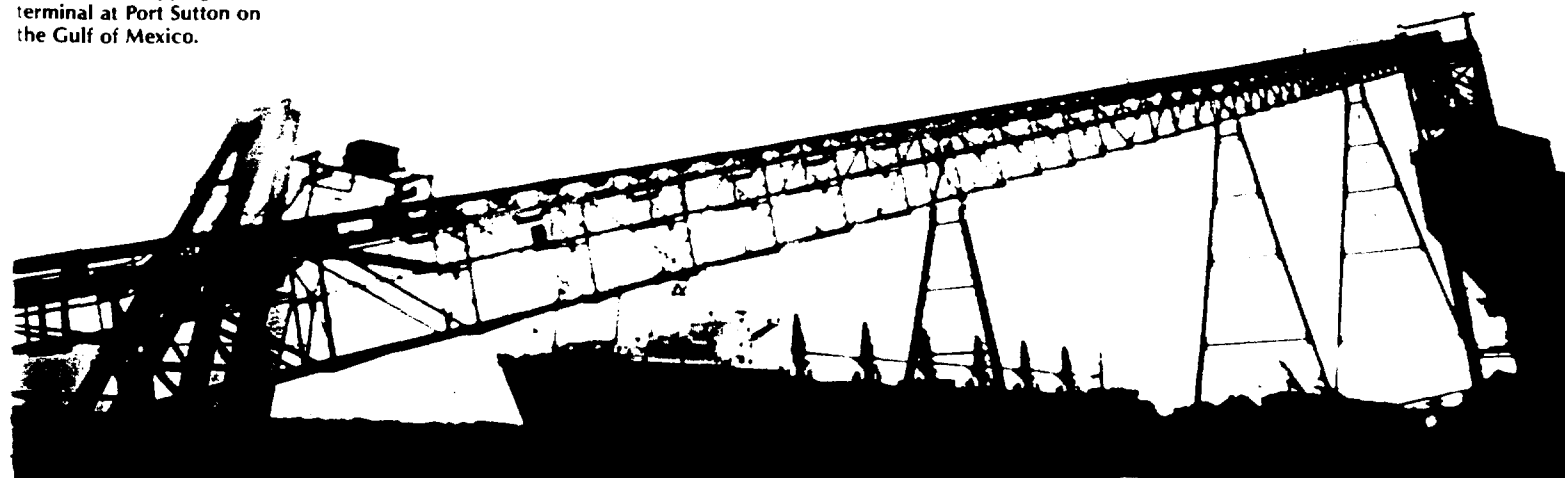
The potash deposit, first discovered in the Canadian province in 1943 by an oil exploration crew at the 7400-foot level, is located below a diverse series of geologic formations or strata...each posing different and complicated challenges to the workers digging the shaft that was needed to reach the ore.

The successful completion of this mining in the face of tremendous odds was an exciting story involving the overcoming of the Blairmore, a 200-foot-deep mass of semi-fluid quicksand under explosive pressures, as high as 475 pounds a square inch, by a shaft-sinking method called "tubbing", a procedure never before used in North America.

Tubbing began with the freezing of the fluid quicksand and subsequent lining of the shaft with cast iron panels, each weighing four tons. Seven million pounds of cast iron tubbing and 17,000 giant bolts were used in shutting out the Blairmore strata.

The project also incorporated new technology to counter other problems during the five-year shaft-sinking, but the company's determination and pioneering effort opened up Saskatchewan's rich potash deposit in 1962...and also paved the way for a second IMC mine (K2) which was completed in 1967.

MILLIONS OF TONS OF PRODUCT are moved by IMC Fertilizer each year. To perform that task efficiently, the company has more than 3,000 leased and owned rail cars as well as its ocean shipping terminal at Port Sutton on the Gulf of Mexico.



Unlike the company's Carlsbad operation, IMC's Canadian potash mining is done with 70-ton machines known as "continuous miners" to remove the ore. Each machine can mine up to 700 tons of ore per hour. The ore is transported on conveyors to hoisting facilities where it is taken to either of two modern refineries for processing, storage and shipment to agricultural markets in the United States and around the world.

Completing the 'Basic' line with nitrogen . . .

The company's initial entry into nitrogen fertilizer production was through a 1963 joint venture with Northern Natural Gas Company of Omaha, Nebraska, to build and operate Nitrin, Inc., a modest-sized production facility on the Mississippi River at Cordova, Illinois.

Nitrin, which produced a full line of nitrogen products, including anhydrous ammonia, ammonium nitrate, urea and nitrogen solutions, ceased operation in 1968 when larger plants utilizing more efficient, bigger capacity production technology came on-stream.

The company returned as a nitrogen producer in 1975 when IMC acquired Commercial Solvents Corporation, including that company's nitrogen production facility at Sterlington, Louisiana. That put IMC back in the ammonia business with a modern, efficient plant that offered reliable supplies of natural gas and transportation systems to major markets. In 1977, IMC built a second ammonia plant at Sterlington, increasing the facility's annual production capacity to more than one million tons, about five percent of total U.S. capacity.

About half of Sterlington's ammonia production currently is used by the company's own New Wales operation. The rest of the plants' output is transported by pipeline, truck, barge and rail to major domestic markets throughout the central United States.

CARLSBAD, NEW MEXICO
POTASH has been a key part of IMC Fertilizer's business since 1941, producing three types of that basic crop nutrient.

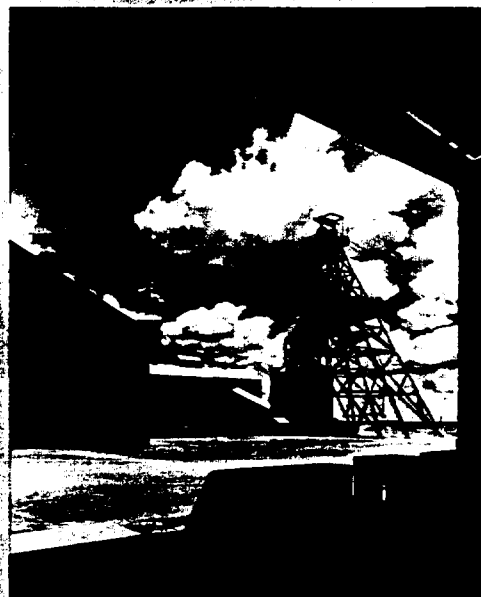
From the outset, close ties with American farmers . . .

IMC has been closely associated with the mixed fertilizer business from its beginning in 1909.

From the beginning, the original owners sensed a growing demand for mixed fertilizer. Believing that the finished product side of the business offered great commercial possibilities, the company invested a substantial

portion of its capital to purchase a series of mixed fertilizer plants. The first were in Buffalo, New York; East Point, Georgia; Montgomery, Alabama; Florence, Alabama; and Houlton, Maine.

The Florence plant still in business today, claims the distinction of being the oldest continuously operating fertilizer facility. Prior to its



The company's original Mixed Fertilizer Division, later called the IMC Plant Division and more recently, the Rainbow Division, grew rapidly in its first 10 years, acquiring or constructing 25 mixed fertilizer plants.

It continued to expand operations into new markets until the 1980s, the period of peak involvement in the retail business.

Distribution changes in the important midwestern U.S. market resulted in IMC re-directing its sales efforts from traditional retail to larger-volume, wholesale activities. Today, key Corn Belt states are served by a range of suppliers, from local dealers to large, regional cooperatives, most of whom rely upon fertilizer producers such as IMCF to meet their raw material needs.

Meanwhile, the company's Rainbow Division continues to produce and market its line of premium products throughout the Southeastern U.S. where long-term growth and success in the retail marketplace has been achieved by an aggressive, agronomic-based marketing effort on behalf of Rainbow® and Super Rainbow® premium products.

Those products of the 1990s continue the tradition

**CANADIAN POTASH
DEPOSIT**, first commercialized
by IMC Fertilizer in 1962, is
mined by efficient machines
which can remove up to 700
tons of ore per hour.



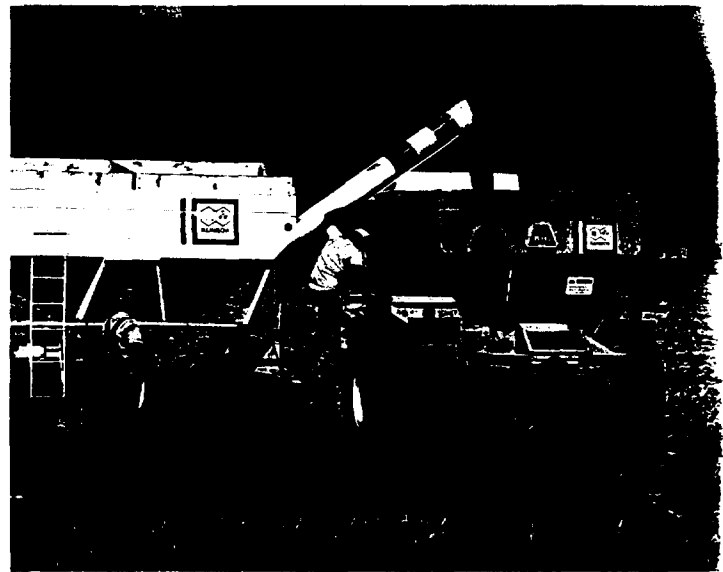
of quality introduced back in 1925 when the company sold its first premium fertilizer...Rainbow for Cotton. That initial product became the start of a family of premium fertilizers until 1962 when IMC introduced its first Super Rainbow product, formulated to meet even more specific crop needs for higher, more profitable yields.

Today, IMC Fertilizer's Rainbow Division operates four major granulation production facilities at Americus, Georgia; Florence, Alabama; Hartsville, South Carolina; and Winston-Salem, North Carolina. The Rainbow Division also operates 15 smaller facilities, primarily in the southeastern U.S. for bulk-blending and/or warehousing.

Moving millions of tons to market . . .

IMC, as a major producer and distributor of fertilizer materials to domestic and world markets, moves millions of tons of product each year, utilizing all forms of transportation, but throughout its history, the company has relied upon rail transportation to

DOMESTIC MARKETS
are served by wholesale
specialists and by the
company's own retail
sales organization which
produces and sells
Super Rainbow to
U.S. farmers.



move the bulk of its output.

Prior to 1964, the company relied upon the railroads to supply cars and tanks for movement of its products. However, at that point, IMC began to build its own fleet of rail and tank cars, until today, the company's fleet consists of about 3,000 owned or leased cars.

That strategy assures the company of an adequate supply of rail cars to meet seasonal requirements in all major domestic markets and to insure prompt delivery of product to ocean ports for export.

One result of this close association with the

...has been the development of a special business plan for the control of ... is particularly valuable because the company is not and expanded in 1950 to increase its capacity and open markets for all areas ...

Office Moves Trade Corporate Growth

The company's first headquarters were located at 165 Broadway, New York City, with administrative offices in London, England. By 1940, the company had moved its offices to 100 Broadway, New York City, and in 1941, it moved to 100 Broadway, New York City. In 1942, the company moved to 100 Broadway, New York City, and in 1943, it moved to 100 Broadway, New York City. In 1944, the company moved to 100 Broadway, New York City, and in 1945, it moved to 100 Broadway, New York City. In 1946, the company moved to 100 Broadway, New York City, and in 1947, it moved to 100 Broadway, New York City. In 1948, the company moved to 100 Broadway, New York City, and in 1949, it moved to 100 Broadway, New York City. In 1950, the company moved to 100 Broadway, New York City, and in 1951, it moved to 100 Broadway, New York City. In 1952, the company moved to 100 Broadway, New York City, and in 1953, it moved to 100 Broadway, New York City. 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In 2018, the company moved to 100 Broadway, New York City, and in 2019, it moved to 100 Broadway, New York City. In 2020, the company moved to 100 Broadway, New York City, and in 2021, it moved to 100 Broadway, New York City. In 2022, the company moved to 100 Broadway, New York City, and in 2023, it moved to 100 Broadway, New York City. In 2024, the company moved to 100 Broadway, New York City, and in 2025, it moved to 100 Broadway, New York City.

The company eventually acquired its downtown offices and in 1958 constructed a five-story office complex on 121 West Adams Street, Chicago, a suburb north of Chicago.

A subsequent move occurred in 1972 when the company combined its headquarters with its grown services center to place corporate headquarters in the McPlaza Building, Chicago, also located in Chicago.

That property was sold in 1979 when the corporation moved its corporate headquarters to Northbrook, Illinois, retaining a large general office in Chicago.



INTERNATIONAL
MARKETING features a
unique series of World Food
Production Conferences to
reach world agricultural
leadership series 42
conferences by 1990
to be held in 1990
attended by 1000
industry and government
leaders international

...in all countries a large number of agricultural ...

...in 1988 ...

...in 1989 ...

...in 1990 ...

**IMC Fertilizer today . . .
building for an even brighter future**

Today, IMC Fertilizer Group, Inc., is recognized as a major force in the world fertilizer business; a vital element in the growth and success of global agriculture's challenge to produce more food and better quality food to feed a rapidly increasing population.

From its humble beginnings in 1909, when the new company posted earnings of \$1,017,000 on sales of \$8,506,000, to its results for fiscal 1991, when earnings exceeded \$95.8 million on sales of more than \$1.1 billion, the record has been marked by steady growth.

Today, IMCF represents 36 percent of U.S., and 11 percent of world phosphate rock capacity; it holds 23 percent of North American, and 7 percent of world potash capacity; it has 14 percent of U.S., and 4 percent of world phosphate chemicals capacity.

The company's achievements in production, distribution, marketing and financial management have earned recognition worldwide, and its 6,000 employees, working in mines, plants and offices, continue to distinguish themselves as among the best in the business.



IMCF CHAIRMAN BILLIE B. TURNER
(left), travels worldwide to keep
abreast of global market trends,
including inspections of farming
conditions in China, a major
customer of the company's
products.

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IMC FERTILIZER GROUP, INC. is indebted to William L. (Bill) Baughcum of Rosewell, Georgia, for the years of research he put into discovering and recording historical facts about the company he worked for from 1937 until his retirement in 1973.

Mr. Baughcum's extensive examination of old records and conversations with other IMC Fertilizer veterans, combined with his own experiences in sales management with the company's Plant Food (now Rainbow) Division, have produced this historical portrait of the world's leading supplier of crop nutrients to agriculture.

IMC Fertilizer appreciates Mr. Baughcum's efforts to chronicle the growth of the company from a small phosphate miner in 1909 to today's billion dollar, publicly traded, free-standing industry leader...ready to help world agriculture meet the growing demand for more food, better food, well into the 21st century.

A Proud New Name... A 78-Year Tradition...

IMC Fertilizer Group, Inc. . . a new name backed by the traditions and success of nearly 80 years of service to world agriculture . . .

We are the men and women who produce vital crop nutrients needed by the world's farmers. We are confident of our ability to meet new challenges as new demands grow to even greater dimensions.

This is a report on who we are . . . what we do . . . and where we're headed.

Billie B. Turner

President



**Billie B. Turner
President**

Food!

Nothing's as basic as the food that sustains life itself.

Cereal to help an infant grow... a hearty meal to nourish a worker on the job... or the focal point of a family's special celebration... Food fuels a world population of more than five billion people.

And that number continues to grow by almost 250,000 new mouths a day... an awesome challenge to the farmers around the world.

Population is now forecast to increase by 23 percent between today and the year 2000.

To feed those future generations and improve the diets of today's current population, agriculture must be prepared to grow 31 percent more food on approximately the same amount of land available for crops today.

That means higher yields per acre. Achieving those increased levels of production will require more fertilizer. We estimate a 47 percent increase in usage by the year 2000.

Producing and supplying those nutrients is the business of IMC Fertilizer Group, Inc.

2100
Ten Billion

2000
Six Billion

1987
Five Billion

1975
Four Billion

1960
Three Billion

1930
Two Billion

1800
One Billion

World population growth, charted here, demonstrates the historic increase in demand for more food as almost 250,000 new mouths a day pose an awesome challenge to agriculture.



The Company

Today, IMC Fertilizer Group, Inc. is one of the world's leading producers and marketers of phosphate and potash, two basic crop-producing nutrients, and a manufacturer of the third, nitrogen.

From its start in 1909 as a pick-and-shovel miner of phosphate rock in the hills of Tennessee, the Company was first known as International Agricultural Corporation, and later renamed International Minerals & Chemical Corporation. Over

the years, the Company has earned the recognition as the leading force in the fertilizer industry, first within the U.S., and later worldwide.

After major restructuring and recapitalization of the business, IMC Fertilizer Group, Inc. has emerged as a separate and free-standing company. It continues to be recognized as the leader in the fertilizer industry worldwide.

The Company is best known for its low-cost production capability, innovative marketing programs, and efficient distribution of millions of tons of fertilizer products each year.

The Company owns or operates about nine percent of world phosphate rock capacity, about eight percent of world potash output, and about five percent of U.S. nitrogen fertilizer production.

The Company also recovers uranium oxide from one of its fertilizer products, phosphoric acid, for sale to electric utilities for upgrading as fuel for nuclear power plants.

More than 5,500 men and women in mines, plants and offices around the world ... building and maintaining a competitive edge in major markets through modern production systems, sophisticated distribution networks, and premium product marketing programs.

This is our strategy for success.

SIGNIFICANT EVENTS IN IMC'S FERTILIZER GROWTH

- 1909 *Business begins as International Agricultural Corporation.*
- 1910 *Initial investment in Florida phosphate rock mining operations.*
- 1911 *Tennessee phosphate properties acquired.*
- 1938 *Union Potash & Chemical Company acquired, launching Carlsbad, New Mexico operations.*
- 1942 *Name changed to International Minerals & Chemical Corporation.*
- 1955 *Canadian potash search begins.*
- 1962 *Esterhazy, Canada, potash ore body reached, K1 mine begins operation.*
- 1965 *World Food Production Conference series begins.*
- 1967 *K2 potash mine opens in Canada.*
- 1971 *Phosphate Rock Export Association (PHOSROCK) and Canadian Potash Export Association (CANPOTEX) formed.*
- 1974 *Phosphate Chemicals Export Association (PHOSCHEM) formed.*
- 1976 *Production begins at New Wales phosphate chemicals complex in Florida.*
- 1980 *Uranium recovery operation begins at New Wales.*
- 1982 *SKMg Export Association formed.*
- 1987 *IMC Fertilizer Group, Inc. created.*

The Strategy

IMC Fertilizer Group, Inc. is a new and different company.

We've redefined our businesses and markets. We had to measure our traditional strengths against a new and, at times, difficult domestic and international agricultural environment. We had to determine whether this new organization was in tune with the people who need and use our products.

Extensive research and firsthand experience showed us the world marketplace continues to offer considerable growth potential, with the greatest increases anticipated in developing regions.

In the U.S., numerous positive signals indicate that the long-sought agricultural recovery is well underway, and expected continue to strengthen over the next several years.

We believe the world agricultural outlook is getting brighter, and fertilizer demand will increase accordingly.

The time appears right to create a new corporate entity with resources and disciplines that work in harmony to produce a world class organization, with unique strengths and flexibility.

The challenge to IMC Fertilizer Group, Inc. remains simple enough... to take full advantage of each opportunity.

We're keying our actions to function most effectively in each of the various environments in which we do business.

A few examples are in order:

In Florida, we manage every element of our extensive phosphate operations in a coordinated plan that builds on the strengths of each individual unit. Together, they permit us to be more efficient, to

achieve lower-cost production, increased sales and corresponding profit-producing advantages.

In Louisiana, our nitrogen operations provide captive, low-cost ammonia needed for our phosphate chemicals business. Here too, we seek out the best use of investment in a secure, economical and dependable natural gas feedstock, and we continue to examine creative ideas to maximize our investment.

The same search for the best way to manage our assets has directed strategies at our major potash production operations in New Mexico and Saskatchewan, Canada.

New markets, production improvements and distribution efficiencies combine to enable us to retain and even increase market share despite competitive pressures and external factors that impact our business.

The commitment to excellence that helped our business grow from its beginnings in 1909 today supports us in our present position as a leading world supplier of food-producing nutrients.

The strategy continues to focus on a fundamental, basic objective to maximize our return on investment... to generate meaningful earnings from the most effective use of our valuable assets.

We intend to continue that effort through effective use of the resources at our disposal... our modern mines and plants, extensive in-the-ground reserves, and skilled, dedicated people... to retain the Number One ranking as the world class producer, distributor and marketer of fertilizers to the world.

Phosphate

IMC Fertilizer Group, Inc. can produce nearly 20 million tons of phosphate rock a year. The Company's four phosphate rock mines and beneficiation plants, located in Polk and Hillsborough counties of central Florida, have an annual capacity of 12.5 million tons. An additional 2.5 million tons-a-year represents a 50 percent share in

our Four Corners Mine joint venture with W. R. Grace, and another five million tons are available from two mines leased from Brewster Phosphates.

The Company owns or controls nearly 275 million tons of phosphate rock reserves that are mineable from present facilities, plus another estimated 243 million tons of additional deposits in south Florida. Extensive reserves provide long-term supplies for continued operations well into the next century.

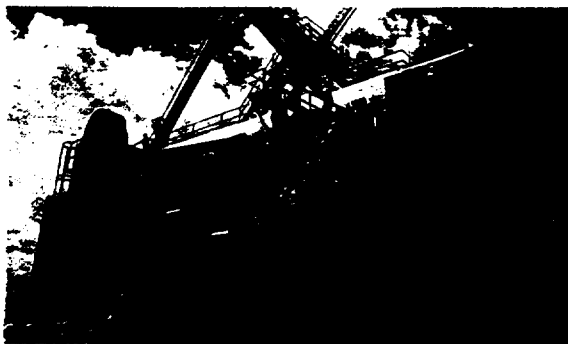
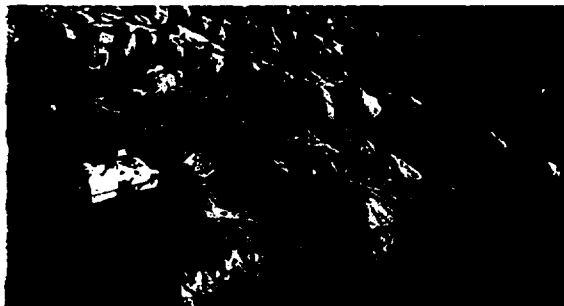
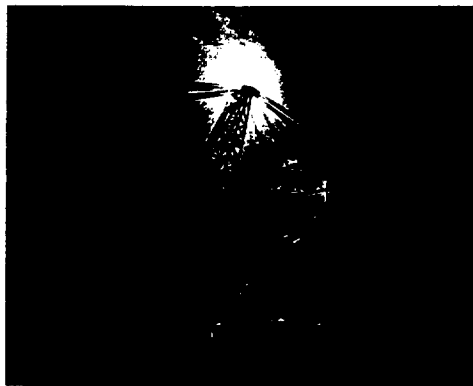


New Wales phosphate chemicals complex, with an annual capacity of 1.7 million tons of phosphoric acid equivalent products, produces a variety of fertilizers, animal feed ingredients and uranium oxide, which is upgraded for use as a fuel in nuclear power plants.

Also in Florida, IMC Fertilizer Group, Inc. produces phosphate chemicals at its state-of-the-art New Wales operation. The huge facility can produce 1.7 million tons of phosphoric acid P_2O_5 equivalent products a year, including diammonium (DAP) and monoammonium (MAP) phosphates, triple superphosphate (TSP), and merchant grade phosphoric acid.

The New Wales complex also includes the Company's uranium oxide recovery facility, which produces and markets that product for use as a fuel in nuclear power plants.

The uranium operation represents another example of the Company's maximization of assets.



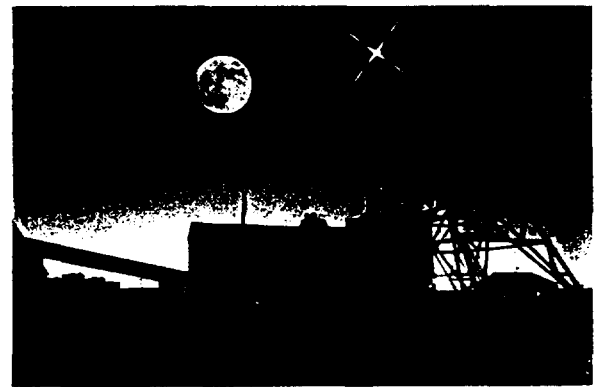
Ten giant draglines, capable of digging up to 100 tons in a single bite, start the phosphate ore on its way to processing in modern, highly efficient plants, for shipment to world markets and to New Wales for upgrading into phosphate chemicals.

Potash

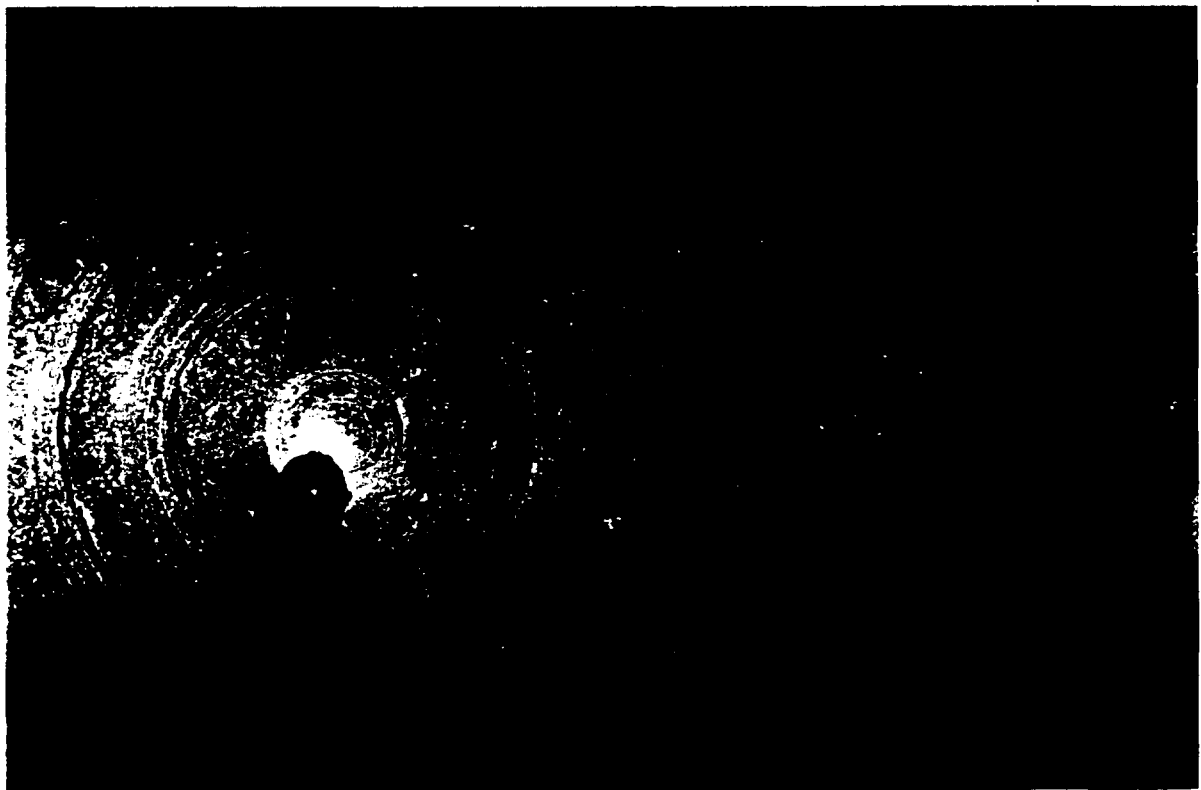
IMC Fertilizer Group, Inc. mines potash, the second primary crop nutrient, at three underground mines and modern refineries in the U.S. and Canada. With a combined capacity of about five million tons a year, the Company is the largest private enterprise potash producer in the world.

Two mines are located near the town of Esterhazy in southeastern Saskatchewan, Canada, where, in 1962, the Company was the first to successfully develop what experts describe as the richest potash deposit in the world.

The two mines and refineries at Esterhazy have a combined annual capacity of 4.2 million tons of muriate of potash.

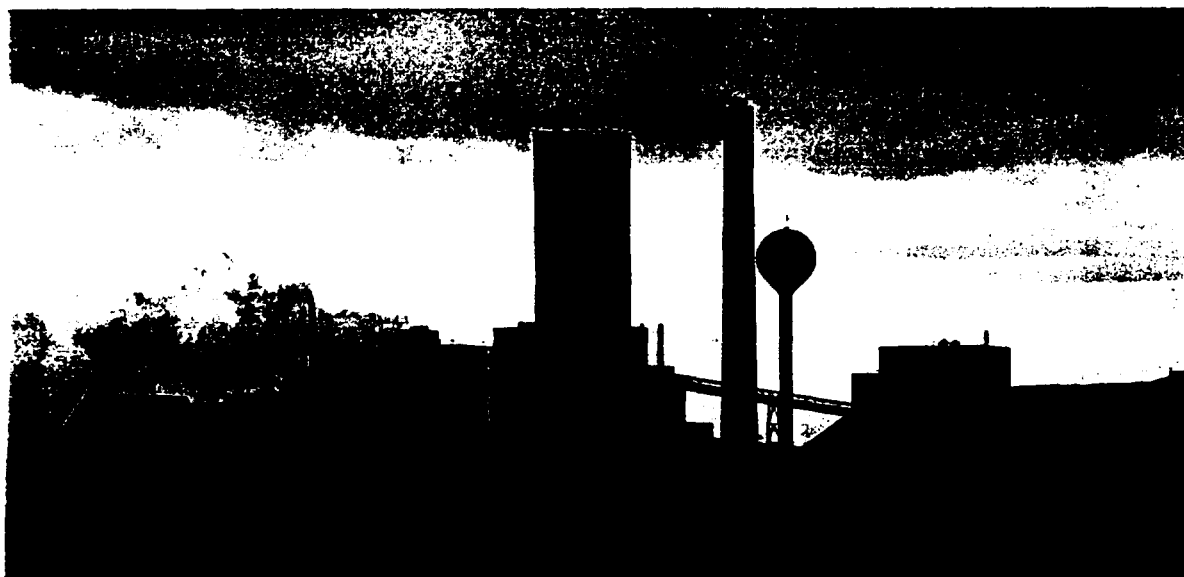
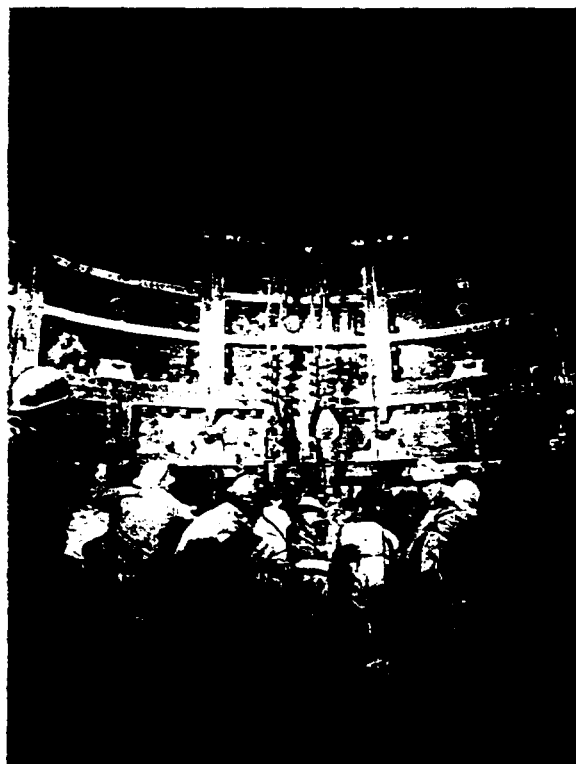


Three mines in New Mexico and Saskatchewan, Canada, with a combined annual capacity of five million tons, provide a variety of potash products to meet different needs as basic fertilizer materials and for special industrial uses.



In addition to muriate, the Company produces and markets two other potash products at our mine near Carlsbad, New Mexico. One is a double sulphate of potash magnesia, a specialty fertilizer product, marketed under the trade name

Sul-Po-Mag®. The other, a sulphate of potash, is used in a variety of special crop nutrient applications, including corn, soybeans, vegetables and fruits.



The first company to successfully open the rich Saskatchewan potash deposit by a unique mining method that involved freezing the ground and innovative protective measures (upper left), the Company is the largest private-enterprise producer in the world.

Nitrogen

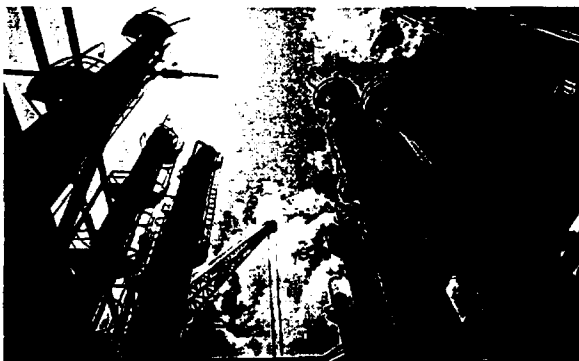
Nitrogen, the third basic fertilizer material, is produced at IMC Fertilizer Group, Inc.'s two modern chemical process plants at Sterlington, Louisiana.

The plants, featuring new and highly efficient technology, have a combined capacity of one million tons a year of anhydrous ammonia, or about five percent of total U.S. production. About 50 percent of the plants' output is used internally, either at our New Wales phosphate chemicals operation or in the manufacture of mixed fertilizers for the U.S. domestic market.

Products are transported from Sterlington by rail, truck, pipeline and inland waterways to major agricultural markets throughout the southeastern and midwestern U.S.

The Sterlington operation also produces a number of nitrogen-based products marketed through long-term contracts for a variety of non-agricultural uses.

Two modern nitrogen plants at Sterlington, Louisiana, with a combined annual capacity of one million tons of anhydrous ammonia, feature efficient facilities to utilize trucks, pipelines, rail and waterway distribution systems in serving agricultural and industrial markets.



Distribution

IMC Fertilizer Group, Inc. mines and plants must be located where the potash, phosphate and other vital feedstocks for our operations are found... not always near the customers for those products.

So the Company has become a major mover of big tonnage worldwide. We ship nearly 20 million tons of products to domestic and international customers each year, utilizing all forms of transportation: rail, ship, barge, pipeline and truck.

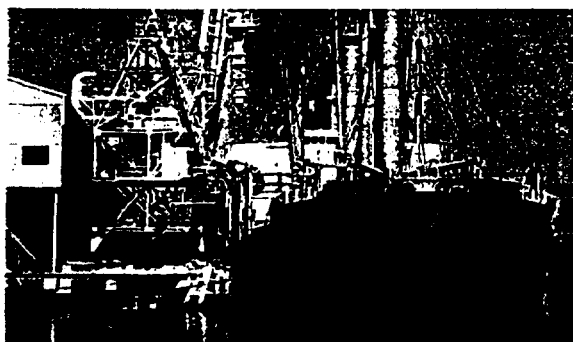
But IMC Fertilizer goes beyond the basic task of moving product to market in the ordinary manner, where traditional means may not be the most efficient.

Over the years, we have pioneered new distribution methods, new strategies to

afford IMC customers the most economical and dependable delivery possible. The result has been the utilization of unmatched distribution capability as an important element of our Company's total marketing success.

IMC Fertilizer distribution innovations include such advances as the first potash unit train, reducing delivery times from Saskatchewan mines to Corn Belt states by half; computerized rail car tracking to anticipate potential delays and expedite deliveries during critical selling seasons; back-haul programs for phosphate rock; in-market warehouse networks to meet changing needs within the domestic marketplace; and regional bulk warehousing to serve special international market demands.

Moving millions of tons of product efficiently and reliably... another key element of IMC Fertilizer Group, Inc.'s total commitment to doing the things our customers need and expect from the leader in a highly competitive industry.



Nearly 20 million tons of products are moved each year to domestic and international markets, using state-of-the-art distribution methods; unit trains, ocean terminals and in-market facilities to meet varied and changing customer needs.

The Markets

IMC Fertilizer Group, Inc.'s products are sold to the largest and smallest customers around the world because they are basic to increasing food productivity and achieving top profits in the most advanced as well as developing economies.

Our customers range from individual family farmers, retail outlets, and regional farm cooperatives, to independent fertilizer manufacturers, large grain, agribusiness organizations, and governments around the world.

Serving such a broad customer base cannot be done through any single marketing strategy. It demands special attention to the needs of each segment of our business, and that has been a trademark of our success since the mid-1950's.

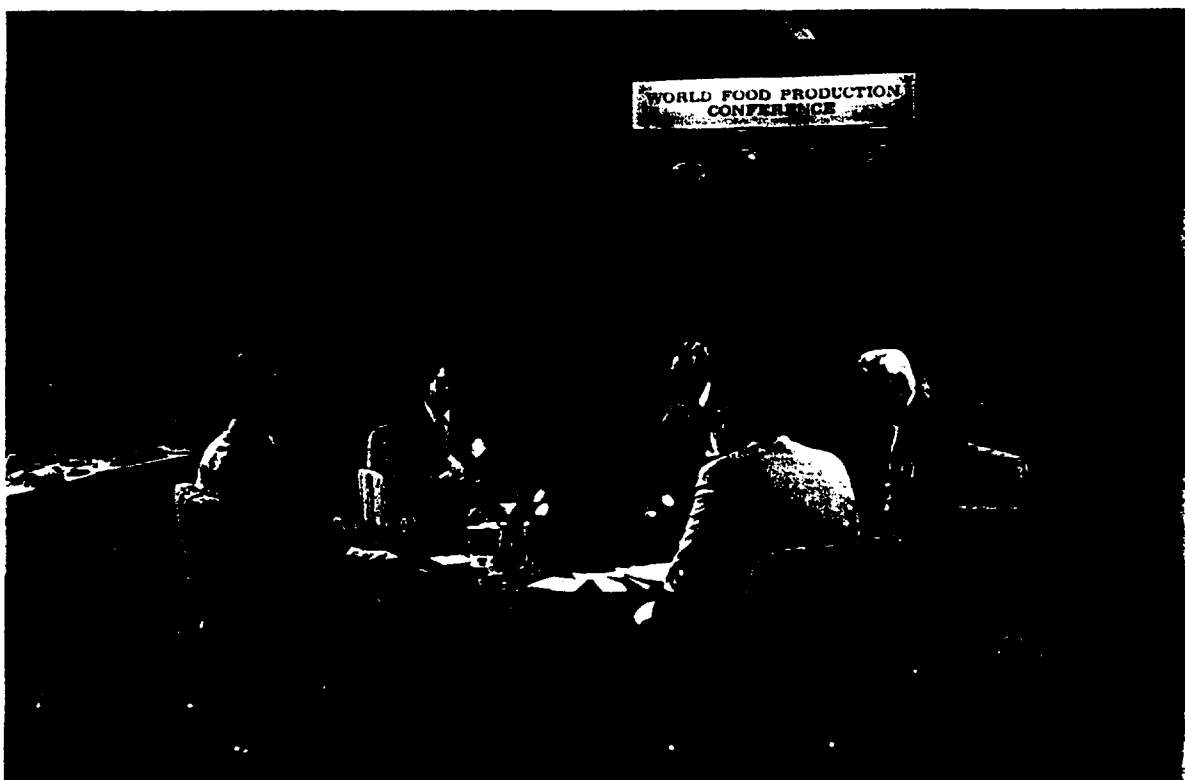
Tailored marketing programs, designed to meet the specific needs of our various customer groups, continue to make us different from the competition.

As a major supplier to the U.S. wholesale fertilizer business, we offer a broad range of customer services unmatched in the industry... technical and agronomic support, specialized training, assistance in our customers' own marketing activities, and a variety of other help.

IMC Fertilizer's Rainbow Division, built around the manufacturing and marketing of premium products under our Rainbow brand name, ranks as a leading supplier of quality mixed fertilizers throughout the southeastern U.S. Organized around four large, efficient granulation plants and a network of 17 local sales/service centers in eight states, the Rainbow organization works closely with farmers, agricultural lenders, university specialists and others deeply involved in the farming sector.

One ongoing domestic marketing strategy that reaches into both wholesale and retail areas is the highly successful

One of a variety of successful marketing strategies continues to be the Company's unique series of more than 40 World Food Production Conferences, held since 1965, to help increase food output and availability through the regular exchange of ideas among financial, agricultural, academic and government experts.



Maximum Economic Yield (MEY) program. This concept, endorsed by leading agronomists, seeks to demonstrate the logic of a complete crop management program to produce the most profitable yield levels.

MEY, and similar activities, require a new level of education for many customers, and we help them prepare to meet that challenge through the most extensive training programs in the industry.

Over the past 30 years, we have provided training for thousands of customers, employees and, more recently, groups such as agricultural lenders and others whose decisions impact on fertilizer customers' ability to buy our products.

A dramatic example of the Company's willingness to do things differently to achieve its marketing objectives has been the effective use of advisory panels to learn what our customers really need, and what they can most effectively use in their own

businesses.

Since the late 1950's, the Company has conducted a variety of advisory panels across the U.S., involving dealers, customers, farmers, research and financial leaders. The programs continue to offer timely information that participants effectively use in their individual business management decisions.

While successful in the domestic market, this strategy has been even more valuable overseas where, since 1965, the Company has conducted a unique series of World Food Production Conferences.

More than 40 such conferences have been held around the world since 1965. The series continues to attract wide attention as a private-sector forum offering industry leaders a practical opportunity to learn from others while contributing toward solving the complex, critical problem of global hunger.



Training programs, agronomic aids and management counseling help customers improve crop yields through more efficient use of fertilizer and other modern farming inputs. Activities, ranging from one-day sessions to six-month courses in a broad range of topics, support both domestic and international marketing efforts.

Cash Management

Big tonnage, efficient production and sophisticated distribution systems provide the visible symbols of IMC Fertilizer Group, Inc.'s position as a major world leader in our industry.

But equally important is the financial side of the business, and it is here that IMC has earned equal recognition for the Company's effective cash management strategies in recent years.

That attention to the dollars and cents of doing business extends to every segment of the organization, with much of the resulting benefits coming from several key areas:

1. Capital spending has been carefully managed at all locations, large and small.
2. Production facilities are maintained in mint condition.
3. Working capital controls are constantly monitored, enabling us to improve performance through maximum use of available finances.

4. Inventory control and product management are recognized as key elements in the total financial effort.

5. Receivables, always a function of sales, are measured against tough, objective standards to encourage the lowest possible levels.

The net result is a comprehensive, aggressive approach that maximizes the potential return from sound, innovative cash management at all levels of the organization.

Asset management includes innovative programs to protect, conserve and restore water supplies in Florida.



Responsibility

The men and women of IMC Fertilizer Group, Inc. are committed to improving their working and living environments... to improving the quality of life.

Each year, the Company invests many millions of dollars and hours to help protect the air, the water, and land.

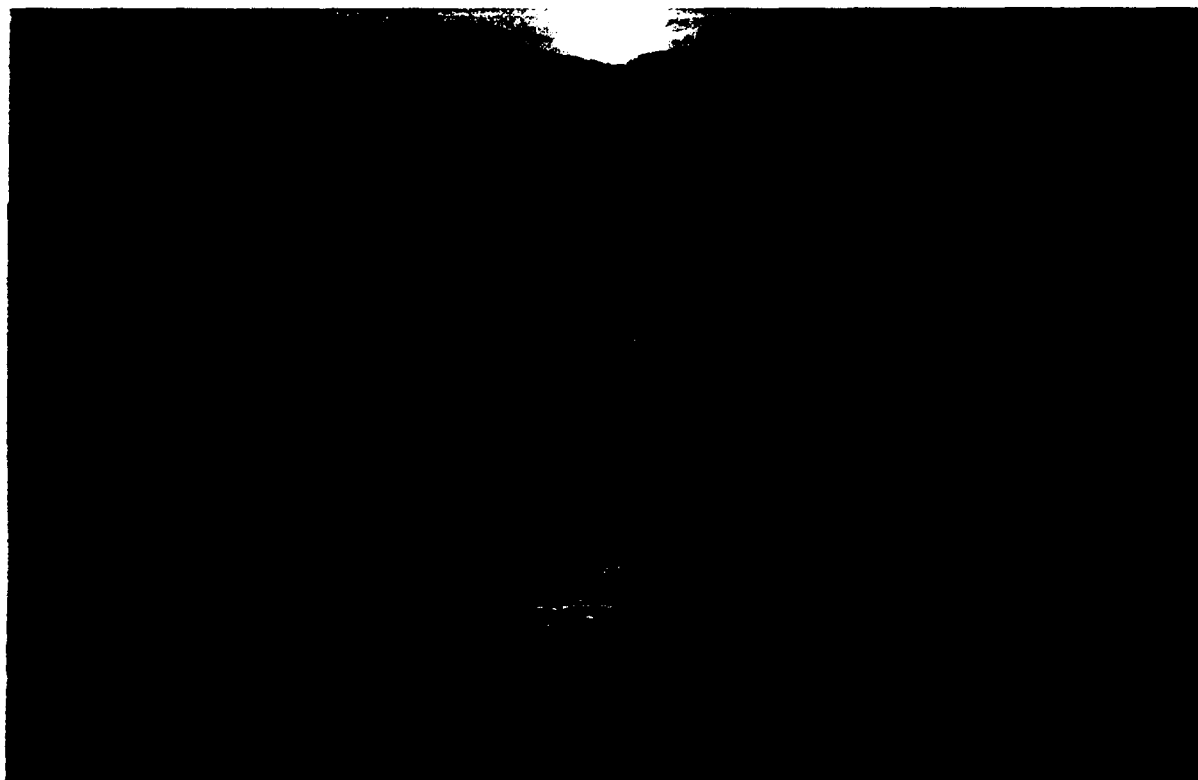
Pollution control systems that meet or better all existing requirements... systems for conserving, purifying and restoring the water supply.

Energy conservation represents another important area of commitment in terms of invested time and money.

At New Wales, state-of-the-art co-generation technology permits us to generate our own electrical energy. We even sell excess energy to a local utility.

Reclaiming mined land or managing land yet to be mined for profitable agricultural uses... working with conservationists to protect wetlands and wildlife... The Company's extensive activities in the area of public responsibility have earned us commendations from federal and state agencies, but that's not the goal of our investment in protecting the environment.

It is IMC Fertilizer people accepting responsibilities... to the industries they serve, to the people whose lives they touch, to the generations that will follow.



Environmental protection remains a key element in the Company's social responsibility strategy, with programs to conserve and restore the water supply, safeguard wildlife and reclaim mined land for future productive use in agricultural, recreational and residential developments.



FERTILIZER GROUP, INC.

IMC Fertilizer Group, Inc.
2315 Sanders Road
Northbrook, IL 60062
312 564 8600



Rev. 4/81

HISTORY OF THE RAINBOW DIVISION

TODAY, I WOULD LIKE TO TELL YOU SOMETHING ABOUT THE RAINBOW DIVISION. ITS ROOTS GO BACK TO 1909, THE CORPORATION'S FOUNDING, MINING ROCK PHOSPHATE IN TENNESSEE AND FLORIDA. THE CORPORATION, CALLED INTERNATIONAL AGRICULTURAL CORPORATION (IAC), ACQUIRED A NUMBER OF PLANTS.

BUFFALO, NY	1908/09 - 1968/69
EAST POINT, GA	1908/09 - 1966/67
MONTGOMERY, AL	1908/09 - CONVERTED TO MATERIALS WAREHOUSE 1959/60
FLORENCE, AL	1909/10 - PRESENT
HOLTON, ME	1909/10 - 1958/59
AMERICUS, GA	1910/11 - PRESENT
AUGUSTA, GA	1910/11 - PRESENT
LOCKLAND, OH	1910/11 - 1968/69
SPARTANBURG, SC	1910/11 - PRESENT
TIFTON, GA	1912/13 - PRESENT

EIGHTEEN OF THEM WERE EACH PRODUCING 18-20,000 TONS OF MIXED FERTILIZER ANNUALLY BY THE END OF 1925.

IN THOSE YEARS THE BUSINESS WAS SIMPLE
...MANUFACTURING A FEW LOW ANALYSIS,
BASIC NPK GRADES OF PULVERIZED MIXED
FERTILIZER.

MANY EARLY PLANTS, FOUND AT SEAPORT
LOCATIONS, DEPENDED ON IMPORTED MATERIALS...
POTASH FROM EUROPE...NITRATES FROM SOUTH
AMERICA...BONES FROM INDIA...AND FISH
MEAL FROM LOCALLY BASED FISHING FLEETS.
OTHERS WERE GENERALLY IN CITIES WHERE
A SUBSTANTIAL LIVESTOCK PROCESSING
INDUSTRY OFFERED TANKAGE, BONE MEAL,
BLOOD MEAL, HOOF AND HORN MEAL, BUFFALO
WAS A SPECIAL CASE... IMPORTANT BECAUSE
A BY-PRODUCT, AMMONIUM SULFATE, OF THE
STEEL INDUSTRY AND CHEAP HYDROELECTRIC
POWER, MADE CALCIUM NITRATE AN ECONOMIC
RAW MATERIAL. THE DISTRIBUTION WAS
SIMPLE. ABOUT 90% OF THE PRODUCT LEFT
PLANTS GOING TO FARMERS AND DEALERS IN
RAILCARS AND THE REMAINDER BY HORSE DRAWN
WAGONS. TRUCKS LATER BECAME THE PRE-
DOMINANT MOVERS OF FERTILIZER.

IN-PLANT MOVEMENT OF MATERIALS WAS DONE BY TWO WHEELED CARTS WHICH WERE CALLED "GEORGIA BUGGIES" AROUND THE SOUTH. GENERALLY ONE MAN WORKED AT EACH SIDE OF THE CART USING SHOVELS TO LOAD THEM. THAT OPERATION WAS STREAMLINED BY PAIRING A LEFT HANDED MAN WITH A RIGHT HANDED MAN.

MANY OF THE PLANTS HAD ADDED ACIDULATION UNITS DURING THE "TEENS". THESE UNITS COMBINED SULFURIC ACID WITH PHOSPHATE ROCK TO MAKE 16-19% SUPERPHOSPHATE...A RAW MATERIAL FOR MIXED FERTILIZER. SOME OF THOSE EARLY UNITS ARE STILL OPERATING TODAY.

PREMIUM FERTILIZER WAS INTRODUCED BY IAC IN 1925 AT MONTGOMERY, ALABAMA. IT WAS RAINBOW DESIGNED FOR COTTON. SECONDARY AND MINOR ELEMENTS WERE FIRST RECOGNIZED. AS NECESSARY FOR PLANT GROWTH.

FOLLOWING THE GREAT DEPRESSION OF THE 30'S A FEW PLANTS WERE SOLD.

By 1950 there were perhaps 25 or 30 plants located in the East, Midwest, South and Southwest. In the early 1950's when granular fertilizer technology was developed, the Plant Food Division, as it was then known, installed small granulation units at several of its Midwest and Southwest plants.

Granular fertilizer, simply put, is chemically combining all the ingredients... N, P, K, secondary and micronutrients into a single granule. Each granule is a complete fertilizer within itself.

In the 50's the Division was producing sulfuric acid at as many as five plant locations. Micronutrient mixture was being produced at East Point, Georgia and later at Tupelo, Mississippi. Today it's often cheaper to buy the micronutrients than produce them ourselves.

IN THE 60'S TWO SIGNIFICANT EVENTS BROUGHT NEW DIRECTION TO THE INDUSTRY AND TO THE DIVISION. ONE WAS AN ABUNDANT SUPPLY OF NITROGEN FROM OLD MUNITIONS PLANTS...THE OTHER WAS THE RAPID GROWTH OF FERTILIZER CONSUMPTION IN THE CORN BELT MARKETS. LIQUID NITROGEN FOR DIRECT APPLICATION EMERGED IN THE EARLY 60'S. IT REQUIRES HEAVY CAPITAL INVESTMENTS IN STORAGE TANKS AND NUMEROUS MOBILE NURSE TANKS AND APPLICATION EQUIPMENT. THERE WAS A MAD RUSH BY THE MAJORS TO GAIN A POSITION IN THE MARKET. IMC, LIKE THE OTHERS, WENT TOO FAR WITH THIS UNCONTROLLED EXPANSION.

ABOUT THE SAME TIME BLEND PLANTS WERE EMERGING IN LARGE NUMBERS ACROSS THE MIDWEST. THESE SMALL, IN-MARKET PLANTS STORE 600 TO 1000 TONS OF RAW MATERIALS. GRANULAR NITROGEN, PHOSPHATE AND POTASH MATERIALS ARE INDIVIDUALLY WEIGHED TO DESIRED ANALYSIS AND PLACED INTO A TUMBLER MIXING DRUM FOR A QUICK PHYSICAL MIX.

IN CONTRAST TO AMMONIATED, GRANULAR FERTILIZER, EACH PARTICLE IS EITHER NITROGEN, PHOSPHATE, POTASH OR MINOR ELEMENT. VARIANCE IN PARTICLE SIZE AND DENSITY RESULT IN SOME SEGREGATION DURING TRANSPORTATION, BUT...

BLENDS HAVE SOME ADVANTAGES.

- HANDY TO THE FARM
- AVAILABLE IN HIGH ANALYSIS
- AVAILABLE IN MORE VARIATIONS OF ANALYSIS
- GENERALLY LESS EXPENSIVE

IMC JOINED THIS PARADE OF BLEND PLANT EXPANSION AND OVER EXPANDED.

IN THE MID 60'S WE BUILT OUR FIRST GRANULATION PLANTS IN THE SOUTHEAST. SIX WERE CONSTRUCTED DURING 1964 AND 1965 AND ARE OPERATING TODAY. IT WAS ABOUT THIS TIME THAT THE DIVISION NAME WAS CHANGED FROM PLANT FOOD DIVISION TO RAINBOW DIVISION.

IT WAS DURING THE LATE 60'S THE FERTILIZER INDUSTRY ENTERED A SERIOUS DEPRESSION SPARKED BY OVER-EXPANSION AND SUPPLY/DEMAND IMBALANCE. RAINBOW WAS FORCED TO EVALUATE ITS OPERATIONS AND THE DECISION WAS MADE TO PHASE OUT APPROXIMATELY 75 OF ITS LEAST PROFITABLE PLANTS. THE MAJORITY OF THEM WERE CLOSED AT JUNE 30, 1969...A FEW BEFORE AND A FEW AFTER. THEY WERE MOSTLY LOCATED IN THE EAST, MIDWEST AND SOUTHWEST AND A FEW IN THE SOUTH. THIS WAS A \$20 MILLION WRITE-OFF.

OTHER MAJORS FOLLOWED WITH SIMILAR ACTIONS. TODAY, THERE ARE VERY FEW GRANULATION PLANTS IN THE MIDWEST...MOST FERTILIZER USED HERE IS BLENDED.

BY THE 70'S BLEND PLANTS HAD COME TO THE SOUTH AND WE ARE NOW SEEING RAPID EXPANSION THERE. ALTHOUGH SEVERAL COMPETITORS HAVE CLOSED GRANULATION PLANTS, OUR'S ARE IN EXCELLENT CONDITION, IN COMPLIANCE WITH E.P.A. AND O.S.H.A. REGULATIONS... AND WE BELIEVE MOST OF THEM WILL BE OPERATING SEVERAL MORE YEARS.

IN THE LATE 70'S WE PURCHASED A COUPLE OF MIDWEST BLEND PLANTS AND BUILT SEVERAL SMALL WAREHOUSES IN THE SOUTHEAST. THESE WAREHOUSES CAN BE CONVERTED TO BLENDING CAPABILITIES AS THE DEMAND FOR BLENDED PRODUCT WARRANTS. THESE WAREHOUSES ARE CURRENTLY LEASED TO OUTSIDE OPERATORS WHO PURCHASE THEIR MIXED FERTILIZER FROM US.

THE DIVISION'S CHARTER HAS REMAINED ESSENTIALLY UNCHANGED DOWN THROUGH THE YEARS...TO TAKE RAW MATERIALS FROM BASIC NPK PRODUCING MINES AND PLANTS AND CONVERT THEM TO MIXED FERTILIZER GRADES FORMULATED TO LOCAL REQUIREMENTS AND TO RESELL STRAIGHT FERTILIZER MATERIALS IN THE MARKETS WE SERVE.

YOU CAN SEE LAST YEAR'S SALES VOLUME ON THE SCREEN.

RAINBOW DIVISION

1979/80 SALES VOLUME

MIXED GOODS/BLENDS	850,000	TONS
NITROGEN-MATERIALS	130,000	
PHOSPHATE MATERIALS	55,000	
POTASH MATERIALS	245,000	
OTHERS	<u>70,000</u>	
TOTAL	1,350,000	

THIS VOLUME PRODUCED A RECORD \$24
MILLION DIVISION LEVEL PROFIT ON SALES
OF ALMOST \$150 MILLION.

THE MAIN THRUST OF OUR MARKETING AND
DISTRIBUTION EFFORT IS DIRECTED TOWARD
MIXED FERTILIZERS. THERE ARE THREE
BRANDS WITH THREE DIFFERENT QUALITY
AND PRICE LEVELS:

- INTERNATIONAL - THE COMMODITY LINE CONTAINS
THE BASIC NPK NUTRIENTS.
- RAINBOW - CONTAINS SOLUBLE MG AND AT
LEAST ONE MINOR ELEMENT
IN ADDITION TO NPK NUTRIENTS.
- SUPER RAINBOW - OUR TOP OF THE LINE
CONTAINS EXTRA SECONDARY ELEMENT
(CALCIUM, MAGNESIUM AND SULFUR)
AND MINOR ELEMENTS, (BORON,
COPPER, IRON, MANGANESE, MOLY-
BDENUM AND ZINC).

PREMIUM GRADES ARE MORE COSTLY TO PRODUCE BUT
ARE MORE PROFITABLE TO THE COMPANY AND TO OUR
CUSTOMERS. SUPER RAINBOW AND RAINBOW GRADES
ACCOUNT FOR 63% OF THE MIXED GOODS VOLUME.

WE MARKET FERTILIZER VERY DIFFERENTLY AS WE MOVE AROUND THE DIVISION. IT RANGES FROM ALMOST 100% RETAIL TO CONSUMERS IN SOME AREAS TO ALMOST 100% TO DEALERS AND OTHER MANUFACTURERS IN OTHER AREAS. OVERALL, THE DIVISION SELLS ABOUT

70% THROUGH DEALERS

30% AT OWNED OR CONTROLLED RETAIL
OUTLETS

THE DIVISION IS DIVIDED INTO TEN AREAS AND NINE OF THOSE AREAS ARE GROUPED INTO THREE ZONES. THE TENTH AREA, CENTRAL FLORIDA, IS A DIRECT-REPORTING AREA.

ABOUT 75% OF ALL PRODUCT IS SOLD IN THE SIX SALES AREAS OF THE SOUTHEAST. THE PLANT LOCATION AND AREA OFFICES ARE:

HARTSVILLE, SC

AMERICUS, GA

AUGUSTA, GA

FLORENCE, AL

WINSTON-SALEM, NC

SPARTANBURG, SC

AMERICUS AREA

THE AMERICUS GEORGIA PLANT IS THE LARGEST PLANT WITH ANNUAL PRODUCTION OF ABOUT 170,000 TONS OF MIXED GOODS AND 90,000 TONS OF NORMAL SUPERPHOSPHATE. THE AREA HAS TWO SECONDARY PLANTS...AT TIFTON, GA AND HARTFORD, AL.

SECONDARIES ARE LARGE PLANTS THAT HAVE STORAGE AND DISTRIBUTION FACILITIES TO HELP ACCOMODATE PRODUCTION OF THE GRANULATION PLANT. SINCE ABOUT 65-70% OF MIXED GOODS SALES OCCUR IN A THREE-MONTH PERIOD, SUBSTANTIAL IN-MARKET STORAGE CAPACITY IS REQUIRED.

THE AMERICUS AREA COVERS SOUTHERN GEORGIA, SOUTHERN ALABAMA AND THE NORTHERN TIER OF FLORIDA.

PRINCIPAL CROPS ARE PEANUTS, PECANS, PASTURE, GRAIN, SOME COTTON, TOBACCO AND SOYBEANS.

AUGUSTA AREA

THE AUGUSTA GEORGIA AREA COVERS THE MIDDLE SECTION OF GEORGIA AND THE SOUTHERN ONE-THIRD OF SOUTH CAROLINA WHICH PRODUCES COTTON, GRAIN AND SOYBEANS.

HARTSVILLE AREA

THE HARTSVILLE, SC AREA COVERS THE NORTHEASTERN ONE-THIRD OF SOUTH CAROLINA AND THE SOUTHERN TIER OF NORTH CAROLINA WITH CROPS OF COTTON, TOBACCO AND GRAIN. IN ADDITION TO THE HARTSVILLE PLANT IT OPERATES ONE BLEND PLANT AT FLORENCE, SC.

THOSE THREE AREAS MAKE UP ZONE II IN THE ORGANIZATION.

WINSTON-SALEM AREA

WINSTON-SALEM, NORTH CAROLINA AREA COVERS ABOUT THREE QUARTERS OF NORTH CAROLINA AND SOUTHERN VIRGINIA. DUNN, NORTH CAROLINA IS THE SECONDARY PLANT SUPPORTING THE WINSTON-SALEM GRANULATION PLANT, BOTH SERVING THE TOBACCO BELT.

SPARTANBURG AREA

THE SPARTANBURG, SOUTH CAROLINA AREA OPERATES IN NORTHWESTERN SOUTH CAROLINA, WESTERN NORTH CAROLINA, EASTERN TENNESSEE, NORTHERN GEORGIA AND A FEW VIRGINIA COUNTIES. IT OPERATES A SECONDARY PLANT AT GREENEVILLE, TENNESSEE, IT'S PRIMARILY A PASTURE, FRUIT, VEGETABLE AND GRAIN PRODUCING AREA.

FLORENCE AREA

THE FLORENCE ALABAMA AREA COVERS NORTH ALABAMA AND MISSISSIPPI, WESTERN TENNESSEE AND INTO KENTUCKY. FLORENCE IS OUR SECOND LARGEST PRODUCING PLANT WITH ABOUT 155,000 TONS OF MIXED FERTILIZER AND IS OUR ONLY PLANT LOCATED ON A NAVIGABLE WATERWAY. IT RECEIVES A SIGNIFICANT AMOUNT OF ITS POTASH BY BARGE AND SHIPS SOME 20-25,000 TONS OF MIXED GOODS ON THE RIVER TO THE MIDWEST.

THE AREA OPERATES SECONDARY PLANTS AT ALICEVILLE, AL AND TUPELO, MS. PRINCIPAL CROPS IN THE AREA ARE COTTON, SOYBEANS, PASTURE AND GRAIN.

THESE THREE AREAS MAKE UP ZONE III, WHICH ALONG WITH ZONE II COMPRISE SOUTHERN OPERATIONS.

WE PROBABLY SELL 90% OF OUR VOLUME THROUGH A NETWORK OF DEALERS ACROSS THE SOUTHEAST.

THE DEALER MAY BE A COTTON GINNER, A PEANUT PROCESSOR, A GRAIN ELEVATOR, A GENERAL MERCHANDISER, A TRUCKER, A TOBACCO WAREHOUSEMAN, A STRAIGHT FERTILIZER DEALER OR A BLENDER.

FERTILIZER IS TRANSPORTED TO THE DEALERS PRIMARILY BY CUSTOMER TRUCKS, CONTRACT TRUCKERS AND BY RAIL. VERY LITTLE COMPANY OWNED TRANSPORTATION EQUIPMENT IS NEEDED.

MULBERRY AREA

THE MULBERRY, FLORIDA AREA COVERS CENTRAL FLORIDA AND HAS THREE LARGE BLENDING PLANTS LOCATED AT MULBERRY, INDIANTOWN AND CLEWISTON. LAST YEAR THESE PLANTS PRODUCED 96,000 TONS OF BLENDED MIXED GOODS. THE SANDY SOILS OF THE AREA WILL NOT HOLD NUTRIENTS AND REQUIRE CONSTANT FERTILIZATION. LITERALLY HUNDREDS OF GRADE VARIATIONS ARE BLENDED FOR FRUITS, VEGETABLES, PASTURES, SUGAR CANE AND GOLF COURSES.

ALMOST ALL PRODUCT IS SOLD DIRECTLY TO FARMERS, GROWERS AND RANCHERS.

MIDWEST ZONE

RAINBOW'S ZONE IV IS DIVIDED INTO THREE AREAS WITH OFFICES AT NEW BRUNSWICK, IN, ERIE, IL AND GENOA, NE.

INDIANA AREA

THE INDIANA AREA CONSISTS OF A CLUSTER OF TEN BULK BLEND PLANTS...ALL REASONABLY NEAR INDIANAPOLIS. PRODUCT IS SOLD RETAIL, DELIVERED AND SPREAD ON FARMS WITHIN A 10-MILE RADIUS OF EACH PLANT. MUCH OF WHICH WE DELIVER AND APPLY TO THE FIELDS.

ILLINOIS AREA

THE ILLINOIS AREA OPERATES IN A SIMILAR MANNER, AND HAS 7 PLANTS WIDELY SPACED ACROSS NORTHERN INDIANA, NORTHERN ILLINOIS AND WISCONSIN.

NEBRASKA AREA

THE NEBRASKA AREA IS SET UP DIFFERENTLY. IT COVERS THE ENTIRE STATE OF NEBRASKA AND THE FRINGES OF SURROUNDING STATES. IT HAS ONLY TWO BLENDING PLANTS. OUR DEALER ORGANIZATION SELLS SUL-PO-MAG, MURIATE OF POTASH, DAP AND GRANULAR MIXED FERTILIZER (8-32-8 SRB). MOST OF THE DAP AND MIXED FERTILIZER IS STORED AT OMAHA AND NEBRASKA CITY IN PUBLIC WAREHOUSES

AFTER BEING RECEIVED FROM THE SOUTH BY BARGE. EXPANDED IRRIGATION DEVELOPMENT HAS MADE NEBRASKA ONE OF THE FASTEST GROWING FERTILIZER CONSUMING STATES IN THE COUNTRY.

THE RETAIL BUSINESS IS SERVICE-ORIENTED. MOBILE EQUIPMENT AT THE PLANTS CONSIST OF A FRONT-END LOADER AND SOMETIMES A FORK-LIFT TRUCK FOR MOVING BAGGED PRODUCTS ON PALLETS. APPLICATION EQUIPMENT MAY INCLUDE A 7½ TON SPREADER TRUCK, FOUR OR MORE PULL-TYPE DRY BROADCAST SPREADERS, NURSE TANKS (1,000-1,200 GALLON CAPACITY) FOR MOVING MIXED LIQUIDS OR NITROGEN SOLUTION TO CUSTOMER'S FIELD.

AMMONIA NURSE TANKS... FOR THE SAME PURPOSE, TOOL BARS, APPLICATORS, SPRAY BOOMS AND ASSORTED OTHER ITEMS. IF CUSTOM APPLICATION IS WIDELY PRACTICED, YOU MAY SEE ONE OR MORE HIGH CLEARANCE SPRAYERS IN THE PARKING LOT AT A MIDWEST BLENDER...AND SPECIAL HIGH FLOTATION SPREADERS.

THE PRACTICE AT RETAIL OUTLETS IS TO AVOID HIGHLY SOPHISTICATED EQUIPMENT AND METHODS WHICH CANNOT BE MAINTAINED AND SERVICED BY THE LOCAL WORKERS AND THE MANAGER. THE LOCAL

OPERATOR PERFORMS THREE FUNCTIONS - HE IS THE MANAGER, HE IS THE SALESMAN AND HE IS THE PRODUCTION BOSS. IT IS AN UNUSUAL SITUATION TO FIND ALL OF THESE SKILLS NEATLY COMBINED IN ONE MAN.

THIS IS REALLY THE PROBLEM YOU FACE WHEN A BIG COMPANY DECIDES TO OPERATE 50, 100 AND EVEN UP TO 200 RETAIL OUTLETS. QUALIFIED, CONSCIENTIOUS AND EVEN HONEST MEN ARE NOT THAT PLENTIFUL. IT IS A MAJOR TASK,...JUST TO RECRUIT AND TO TRAIN GOOD MEN TO RUN THESE OUTLETS.

ONE OF THE BIGGEST PROBLEMS IN A RETAIL OPERATION INVOLVES THE COST OF AND MAINTENANCE OF MOBILE EQUIPMENT. RETAIL OPERATIONS ARE HARD ON EQUIPMENT.

A PULL-TYPE SPREADER SHOULD LAST 5 YEARS, YET EVEN WITH GOOD MAINTENANCE, 3 YEARS IS ABOUT ALL YOU CAN GET. OUR EXPERIENCE INDICATES THAT YOU SHOULD BUY THE BEST EQUIPMENT AVAILABLE WITH THE STAINLESS STEEL HOPPERS, BELTS AND TANKS. INSIST ON EXTRA HEAVY DUTY CONSTRUCTION. IT PAYS OFF AT RETAIL.

ALSO, THE TENDENCY AT RETAIL OUTLETS IS TO UNDER-
PRICE THE EQUIPMENT AND OTHER SERVICES OFFERED..
TO PROVIDE EQUIPMENT TO FARMERS EVEN AT LEVELS
BELOW THE TRUE COST OF OWNERSHIP. THUS, AT
THE END OF 3 TO 4 YEARS, THE LOCAL OPERATOR
DISCOVERS THAT HE MUST REPLACE THE EQUIPMENT,
YET THERE ARE NO PROFITS OR RESOURCES AVAILABLE
TO PAY FOR THE NEW CAPITAL INVESTMENT.

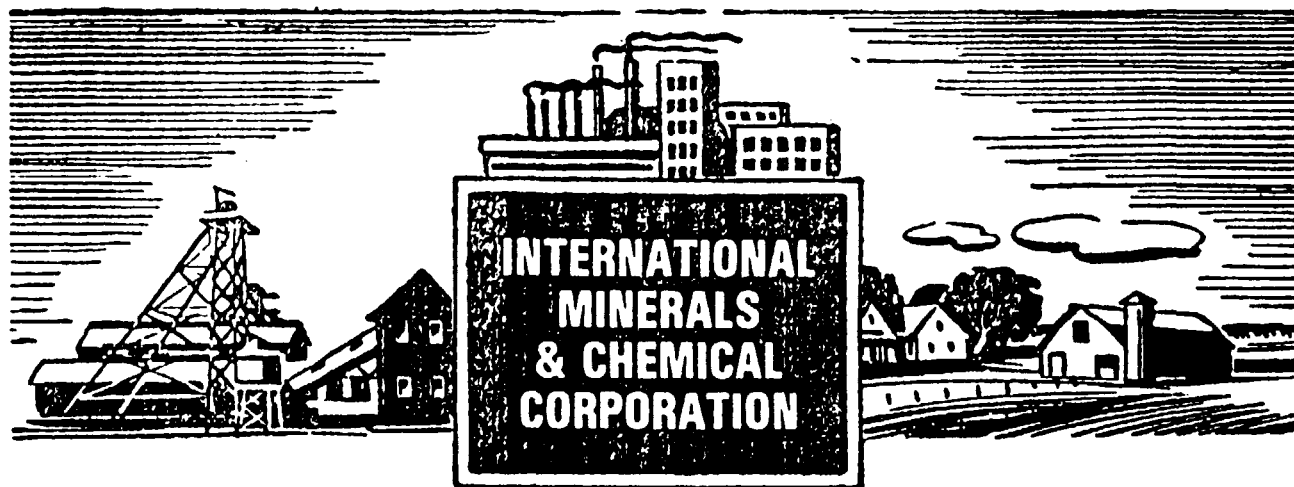
IN MANY AREAS, PARTICULARLY IN SOUTH GEORGIA,
WE HAVE FOUND IT MORE PRACTICAL AND MORE
PROFITABLE TO LEASE OUR OWNED RETAIL OUTLETS
TO RESPONSIBLE LOCAL BUSINESSMEN AND TO
SUPPORT THEIR SALES EFFORTS IN OTHER WAYS.

KEEP IN MIND THAT WE SELL ABOUT 70% OF OUR
MIXED GOODS AND BLENDERS TO DEALERS. ABOUT 30%
OF OUR BUSINESS IS RETAIL TO FARMERS, GROWERS
AND LIVESTOCK MEN.

WE ARE PRIMARILY A GRANULAR MIXED GOODS PRODUCER
PROBABLY NO MORE THAN 20% OF OUR VOLUME INVOLVES
BLENDED FERTILIZERS OF THE TYPE YOU NORMALLY
FIND IN THE CORN BELT.

IF YOU WILL, LET'S TURN TO ANY QUESTIONS
YOU MAY HAVE.

London -
For your file,
G.H.



HISTORICAL DATA





HISTORICAL DATA

<u>YEAR ENDED JUNE 30</u>	<u>EVENT</u>	<u>COMMENTS</u>
1909	Business began as International Agricultural Corporation	Incorporated on June 14, 1909 under the Laws of the State of New York.
	Four fertilizer plants acquired: Buffalo, N.Y., East Point, Ga., Montgomery, Ala., and Houlton, Maine	Initial operations of IMC.
1910	Florence, Ala. fertilizer plant acquired	
	Invested in potash mine in Germany	Issued preferred and common stock valued at \$4 million for 100% interest. Sold one-half interest for \$2,510,375 in cash in 1911-12 year.
	Atlas Phosphate Co., Florida acquired (Prairie Pebble Phosphate)	Acquired for \$3,350,000 of preferred stock, \$2,700,000 of common stock and \$580,000 in cash. Total price, \$6,630,000.
	Florida Mining Co. acquired	Acquired for \$976,400 of preferred stock, \$976,400 of common stock and \$5,324 in cash. Total price \$1,958,124.
1911	Four fertilizer plants constructed: Americus, Ga., Augusta, Ga., Lockland, Oh., and Spartanburg, S.C.	
	Tennessee phosphate properties acquired	Purchased for \$3,667,309 of which \$3,192,545 was for reserves by issuing \$986,100 of preferred stock, \$740,000 of common stock and \$1,941,209 in cash.
1913	Tifton, Ga. fertilizer plant constructed	
	50% interest in fertilizer companies acquired: Catawba Fertilizer Company, Millen Fertilizer Company, Peoples Fertilizer Company, Soperton Guano Company and Shellman Home-Mixture Guano Company	Purchased for \$25,000. Disposed July, 1960. Purchased for \$13,000. Disposed June, 1955. In subsequent years IMC's interest increased to 54% at cost of \$18,556.20. Purchased for \$3,500. Sold November, 1952. Purchased for \$5,000. Disposed December, 1953.
	Arthur Young appointed auditors	Replaced Ernst & Ernst who were auditors in first years of Corporation's existence.
1917	Buffalo, N.Y. plant destroyed by fire	Subsequently rebuilt.
	Norfolk Va. fertilizer plant acquired	Omega plant purchased for \$300,000.
1918	Florida Rock Department started	Prairie Pebble Phosphate Co. and Florida Mining Company, formerly 100% owned subsidiaries operated separately, merged into a new Florida Rock Department effective July 1, 1917.
	Athens, Ga. plant acquired	

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1919	Louisville, Ga. Fertilizer & Gin Company interest acquired	Purchased 50% interest, represented by 400 shares, at a cost of \$31,250.
1921	Woburn, Mass. fertilizer plant constructed	
1923	Orangeburg, S. C. plant acquired	
1924	Recapitalization	Shareholder approval. As of December 1, 1923, \$10,000,000 Prior Preference 7% cumulative and \$2,250,000 common stock (no par value) issued. Sinking Fund Gold Bonds 5%, \$8,228,300 due May 1, 1932 extended to May 1, 1942. \$13,055,500 Cumulative 7% Preferred Stock and \$7,260,600 common stock outstanding June 30, 1923 were reclassified and represented by 450,000 shares of no par value common stock for a value of \$2,250,000.
	Spartanburg, S. C. plant destroyed by fire	Rebuilt next year.
1925	Fertilizer plants acquired in Columbus, Ga. and Jacksonville, Fla.	
1926	Fertilizer plants acquired in Corinth, Miss. and Tupelo, Miss.	
1929	Fertilizer plants acquired in Columbia, S.C. and Texarkana, Texas	
1930	Canadian affiliate incorporated	I.A.C. (Limited), 100% affiliate incorporated in Dominion of Canada.
1933	Montezuma, Ga. fertilizer plant acquired	
1934	Pensacola, Fla. fertilizer plant acquired	
1936	Mulberry Fla. fertilizer plant constructed	
	Swainsboro, Ga. plant acquired	
1938	Fertilizer plants constructed in Chicago Heights, Ill. and Greeneville, Tenn.	
	Wilmington, N.C. fertilizer plant acquired	
	Swainsboro, Ga. plant sold	
	Union Potash & Chemical Company investment	Invested \$100,000 in this Carlsbad, New Mexico, company for 14% of the common stock issued and 25% of the preferred stock issued, an option for future investment, and exclusive agency agreement for the sale of all potash products. A subsequent investment of \$140,000 made possible completion of the shaft and other exploratory work at Carlsbad. Additional common and preferred stock was received for this investment along with an amended option for further investments.
1939	Corinth, Miss. plant abandoned	
	Plants sold in Montezuma, Ga., Orangeburg, S.C., and Athens, Ga.	

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1940	Columbia, S. C. plant abandoned	
	Louis Ware elected Director and President, August 18, 1939	Mr. Ware elected by the Board to replace the deceased Mr. John Watson, who had been president since 1923.
	Hartsville, S. C. plant acquired	
	Union Potash & Chemical Company additional investment	Additional investments of \$800,000 and \$1,500,000 on 7/1/39 and 10/27/39, respectively, International effectively owned 60.6% of the outstanding stock. Initial investments made in 1938.
) 1941	Cullman, Ala. plant acquired	
1942	Pension Trust Plan adopted	Applied to executives and key employees effective July 1, 1941.
	Headquarters moved to Chicago	New York Corporate Office and Atlanta Fertilizer Division Office consolidated in Chicago at 20 North Wacker Drive in July 1941.
	Name changed to International Minerals and Chemical Corporation	December 1, 1941.
	Chicago Heights, Ill. plant destroyed by fire	Subsequently rebuilt.
	3-1/2% Convertible Debentures issued	On February 1, 1942 borrowed \$1,502,000 from First York Corporation in exchange for debentures convertible into 184,864 shares of IMC common after 3/31/42 recapitalization. Proceeds used to purchase minority interests in Union Potash & Chemical Company.
	IMC recapitalized and merged with Union Potash & Chemical Company March 31, 1942	Recapitalization: One share of new \$5 par value common stock for each four shares of old no par value common and 3-1/2 shares of new \$5 par value common stock, and one share of new 4% cumulative preferred stock for each share of 7% cumulative preferred stock and accumulated dividends in arrears.
		IMC acquired substantially all of the remaining nearly 40% minority interest in Union, operator of a potash mine in Carlsbad, New Mexico.
		Union preferred stockholders received \$25 cash plus 4/5 of a share of new IMC common for one share of Union preferred. Union common stockholders received four shares of new IMC common for each five shares of Union common.
		Excess of consideration over book value of net assets acquired \$1,189,506. Recapitalization and merger costs of \$381,000 charged to capital surplus.
	Incentive compensation plan initiated	Bonus plan initiated on June 25, 1942 (Formal adoption of plan in September, 1961. Payments made by direction and order of the Board of Directors prior to September, 1961.)
	Preferred stock dividend began	First dividend paid June 30, 1942 on new preferred.
	German company investment write down	Balance of investment in potash mine purchased in 1909 written down from \$130,000 to \$1.
	Peace Valley phosphate mine, Fla. constructed	Started operating in June, 1942.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1942	Indictment under Sherman Anti-Trust Act	Corporation and one of its officers indicted by a Federal Grand Jury for violation of Sherman Anti-Trust Act with respect to Fertilizer products. Fines of \$9,000 assessed against corporation, \$4,000 against officer. Settlement made to relieve corporation of further expenses and time per advice of counsel.																								
1943	Common stock dividend began	First common stock dividend paid in September, 1942 and continued thereafter until March 30, 1969.																								
	Magnesium plant, Austin, Texas constructed	Built with Government funds, and operated for the Government, beginning October, 1942. Discontinued October, 1944.																								
	Amino Products Co., Rossford, Ohio and Albee Manufacturing Co. acquired November 30, 1942	Albee sold within a year after purchase. Rossford plant operated until closed on October 13, 1956. Original cost \$1,240,000 (Albee \$177,000, Rossford \$1,063,000). For production of monosodium glutamate.																								
	Royalty agreements with Phosphate Recovery Corp. (October 31, 1942) and with Minerals Separation North American Corp. (December 29, 1942)	Agreements on royalties for using patents on flotation process. Royalties paid through August 18, 1959 (expiration of patents) totaled 2,173,956. Production coming from Peace Valley and Noralyn treated by these processes. Name of Minerals Separation changed to Attapulugus Minerals & Chemical Corp. and then to Minerals & Chemicals Corporation of America.																								
	Debt refinanced in January, 1943	<p>\$6,702,000 of debt was retired and \$7,500,000 of new debt issued, as follows:</p> <table><tr><th colspan="2"><u>Retired</u></th><th colspan="2"><u>Issued</u></th></tr><tr><td>2-1/4% term loan</td><td>\$1,000,000</td><td>2-1/2% debentures</td><td>\$3,000,000</td></tr><tr><td>2-3/4% debentures</td><td>1,200,000</td><td>4% debentures</td><td>4,500,000</td></tr><tr><td>4-1/4% debentures</td><td>3,000,000</td><td></td><td><u>\$7,500,000</u></td></tr><tr><td>3-1/2% convertible debentures</td><td><u>1,502,000</u></td><td></td><td></td></tr><tr><td></td><td><u>\$6,702,000</u></td><td></td><td></td></tr></table> <p>3-1/2% convertible debentureholders were issued warrants to purchase 184,862 shares of common stock at \$8.125 per share.</p>	<u>Retired</u>		<u>Issued</u>		2-1/4% term loan	\$1,000,000	2-1/2% debentures	\$3,000,000	2-3/4% debentures	1,200,000	4% debentures	4,500,000	4-1/4% debentures	3,000,000		<u>\$7,500,000</u>	3-1/2% convertible debentures	<u>1,502,000</u>				<u>\$6,702,000</u>		
<u>Retired</u>		<u>Issued</u>																								
2-1/4% term loan	\$1,000,000	2-1/2% debentures	\$3,000,000																							
2-3/4% debentures	1,200,000	4% debentures	4,500,000																							
4-1/4% debentures	3,000,000		<u>\$7,500,000</u>																							
3-1/2% convertible debentures	<u>1,502,000</u>																									
	<u>\$6,702,000</u>																									
	Augusta, Ga. chemical plant constructed	Started production in March, 1943. Plant closed June, 1949. Products: silica gel, epsom salt.																								
	Columbia Park, Ohio chemical plant constructed	Started production of potassium chlorate in April, 1943. Plant closed June, 1949.																								
	Phosphate Recovery Corp. Fla. investment sold	Phosphate flotation process plants acquired from a former affiliate. Sold investment for a gain of \$575,000 pre-tax, after tax \$431,250.																								
	Metals Reserve Co. - Government agency	IMC undertook assignment for a mining plant and developing process for metallurgical separation and concentration of manganese nodules from deposits in South Dakota.																								
1944	Percentage depletion - Potash	Percentage depletion allowance became effective January 1, 1944 provided under Revenue Act of 1943.																								
	Common stock issued for warrants exercised	53,736 common shares issued at a price of \$8.125 per share.																								
	East Point, Ga. plant destroyed by fire May 1, 1944	Rebuilt.																								

YEAR ENDED.
JUNE 30

EVENT

COMMENTS

1944	Trenton, Mich. plant constructed	Wheat gluten plant. (Raw material for monosodium glutamate production.)
	Phosphate ore lands, Fla. sold	Sale resulted in an extraordinary loss of \$443,642.
1945	New mine in the Montana phosphate field commences operation October, 1944	Mine continued on a developmental and experimental basis.
	Ten-year term loan issued January, 1945	Issued bank notes for \$8,000,000 at 2-3/4% and retired \$6,300,000 of debentures that remained outstanding from 1/43 issue.
	Common stock issued for warrants exercised	71,325 common shares issued at price of \$8.125 per share.
1946	Old Still phosphate property, Fla., acquired November, 1945	Purchased about 1,800 acres high grade phosphate reserves at cost of \$2,250,000; for cash of \$750,000 and notes secured by a purchase money mortgage for \$1,500,000. Notes bearing 2-3/4% interest payable \$125,000 a year beginning November 30, 1946.
	Dragline installed at Peace Valley, Fla.	"Bigger Digger," largest ever built, started operating January, 1946 at capacity of 41,027 gross tons per day.
	Common stock warrants issued in June, 1946	Rights issued to holders of IMC common stock and stock purchase warrants to subscribe to one share of common at \$32.50 per share for each five held. Right expired July 8, 1946. 133,834 Shares issued for net proceeds \$4,199,782.
	Investments related to monosodium glutamate: Chemprolin Products, Inc., Boeckler Associates, Inc., and Wheat Products Corp.	Invested \$212,300 representing 40.16% interest to get a raw material (gluten) from the Wheat Products Corp., Trenton, N.J. plant. Invested \$175,000 in the Boeckler Associates, Jefferson City, Mo. plant for the same purpose.
	Common stock warrants exercised	41,740 common shares issued at price of \$8.125 per share.
	Mason City, Iowa fertilizer plant constructed	
	Hartsville, S.C. plant destroyed by fire December, 1944	Rebuilt.
1947	San Jose, Calif. plant completed	Started production of monosodium glutamate (Ac'cent) in May, 1947.
	Achan Mine, Fla. constructed	Started operations in August, 1946.
	International Minerals & Chemicals Limited England organized April 1, 1947	English subsidiary of IMC S.A., Panama subsidiary of IMC (Canada) Limited, 100% affiliate. In 1962/63 investment transferred to IMC-U.S.
1948	3-1/2% term loan issued December 1, 1947	Borrowed \$12,000,000 from Prudential Insurance Co. to pay off serial notes held by banks totaling \$6,625,000 and balance for working capital. Payable at \$650,000 a year starting July 1, 1952 through 1963, balance due on July 1, 1964.
	Noralyn phosphate mine, Fla. completed March, 1948	
	Somerset, Ky. fertilizer plant constructed	
1949	Winston-Salem, N.C. fertilizer plant constructed	

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COMMENTS

1950	Norfolk, Va. plant closed	
	Texarkana, Texas plant destroyed by fire	Rebuilt.
1951	Common stock authorized increased	In December, 1950 a Certificate of Amendment to the Corporation's Certification of Incorporation was filed which increased the authorized common stock from 800,000 to 2,000,000 shares.
	Common stock offered to public December, 1950	Sold 200,470 shares for which the Company received \$9,749,483.
	Common stock distribution December 29, 1950	One share of common stock distributed for each share outstanding (1 for 1).
	Thomson Phosphate Co. acquired December, 1950	Purchased for \$364,419. Marketeers of phosphate rock for direct application.
	Skokie Research Laboratory constructed	Known as the Central Research Laboratory.
	Stock option plan adopted June 27, 1951	Originally reserved 125,000 shares for the granting of ten-year options to officers and key personnel. Option prices range from \$27.97 to \$36.94. Referred to as Plan "A".
	New office building Bartow, Fla. completed	Headquarters for Florida phosphate operations.
	Carlsbad Shaft No. 3 completed	Necessary to extend mine into the southwest area.
	Service center at Noralyn Mine completed	Repair and maintenance center for mobile equipment.
1952	Common stock authorized increased	On July 2, 1951 a Certificate of Amendment filed to the Corporation's Certificate of Incorporation which increased authorized common stock from 2,000,000 to 2,500,000 shares.
	Innis Speiden & Co., and E. S. Browning Co., Niagara Falls, acquired July 2, 1951	Purchased by issuance of 76,648 common shares of stock at total value of \$2,337,764 for net assets of \$2,107,826 in this potassium chemicals business.
	Thomson Phosphate Co. liquidated	
	Fort Worth, Texas fertilizer plant completed December, 1951	
	Eastern Clay Co. acquired December 18, 1951	Issued 83,513 common shares. Valued at \$3,465,789 for net assets of \$1,860,469.
	Eastern Clay Co. dissolved December 31, 1951	Becomes Industrial Minerals Division.
	Fort Worth, Texas fertilizer plant completed December, 1951	
	Columbus, Ga. and Wales, Tenn. plant closed	
	Bonnie, Fla. phosphate chemical plant construction started	
	Analytical Laboratory, Bartow, Fla. constructed	
	Carlsbad Shaft No. 4 completed	

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COMMENTS

1953	Hoover & Mason Phosphate Co., Tenn. acquired July 23, 1952	Issued 40,467 shares of common stock at value of \$1,527,629 for this company which had phosphate reserves.
	Portion of Innis Speiden assets sold September 30, 1952	Sold assets unrelated to IMC operations at Niagara Falls to various parties at a loss of \$96,678.
	Hoover & Mason Phosphate Co. liquidated October 22, 1952	Absorbed in IMC Tennessee Phosphate operations.
	Common stock authorized increased October 28, 1952	Shareholders authorized an increase from 2,500,000 to 3,000,000 common shares.
	Soperton Guano Home Mixture (Joint Corp.), investment sold November, 1952	50% interest acquired for \$3,500 in 1913 sold for \$35,000.
	3.65% Subordinated Convertible Debentures issued	IMC sold through underwriters \$20,000,000 face value. Net cash received \$19,572,511. Convertible into common stock through December 31, 1967. Sinking fund payments of \$1 million a year starting July 1, 1958.
	Consolidated Feldspar & Affiliated Companies acquired November 26, 1952. Affiliates: Western Non-Metallics Co. Carolina Minerals Co. Newdale Mica Co. Canadian Flint & Spar Co., Ltd.	Issued 108,534 common shares (at \$34.50 per share) amounting to \$3,744,423 plus Finders Fee (cash) of \$50,000 for net assets of \$3,896,694. Western, Carolina and Newdale subsequently liquidated June 30, 1953.
	Florida Phosphate Chemical (Bonnie) began operations March 15, 1953	
	Patent infringement suit settled	Suit filed May, 1951 in U. S. District Court, Colorado, by Carlsbad Potash Co. and its directors for infringement on beneficiation process. Settled out of court in April, 1953.
1954	San Jose expansion completed August, 1953	Expansion approximately doubled capacity of monosodium glutamate production.
	Carlsbad MGO-HCl plant completed November, 1953	Commenced shipping acid in January, 1954.
	Investment in Shellman Home Mixture Guano Co. - Joint Corp. sold December 30, 1953	50% interest acquired in 1913 for \$5,000, sold for \$21,750.
	Chicago Packaging plant acquired February, 1954	Purchased plant on Iowa Street for packaging of Ac'cent.
	Deferred Federal income taxes	Reserve was created in this fiscal year and increased annually thereafter in amounts equivalent to the respective years' income tax reductions arising from accelerated amortization of facilities covered by Certificates of Necessity issued during Korean War.
	Certificates of Necessity	Company constructed facilities, aggregate cost \$19,462,218, elected for tax purposes to amortize over five years.
	Janesville, Wis. refractories plant completed	Built at cost of \$225,000.
	Clarksville, Tenn. fertilizer plant completed	

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COMMENTS

1954	East Point, Ga. laboratory started operation Uranium production began	Ten-year contract with Atomic Energy Commission for entire output. Contract subsequently terminated 12-31-59.
1955	Sonsel Refractories Co. and National Foundry Sand Co. acquired July 22, 1954 Ac'cent International, Inc. incorporated U. S. Mining Corp. and Peerless Perlite Co. acquired January 31, 1955 Rochester Industrial Minerals plant, N.Y. sold April 28, 1955 I.A.C. Limited shares sold to Canadian Flint & Spar Co., Ltd. Millen Fertilizer Co. investment sold (Joint Corp.) Florida Bonnie Phosphate Chemical facilities expanded Niagara Falls, N. Y. plant expanded Godwin, Tenn. mica plant acquired Canada potash search	Purchased for \$125,000 cash. Known as Brighton, Mich. plant. Incorporated 11-3-54 under laws of State of Delaware. Purchased for \$226,045 cash. Net assets acquired, \$112,339. Filter Aid patent valued at \$113,706, written down to \$1, June, 1958. Sold for \$28,895. Sold all outstanding stock (20 shares) of IAC , valued at \$2,000 to Canadian Flint & Spar Co., Ltd. Approximately 52% interest acquired for \$13,000 in 1913 sold for \$48,700. For triple superphosphate and dicalcium phosphate production.
1956	Stock option Plan B adopted October 25, 1955 I.A.C. Ltd. & Canadian Flint & Spar Co. merged December 12, 1955 Topsham, Maine plant constructed Godwin, Tenn. mica plant modernized Greeneville, Tenn. mica plant constructed Nepheline Syenite plant at Blue Mountain, Ontario constructed Florida Bonnie Phosphate Chemical facilities expanded	Reserved 50,000 shares for employees other than officers and key personnel for the granting of "two-year" options at \$26.90. Consolidated under the name of International Minerals & Chemical Corporation (Canada) Ltd. New process feldspar plant started. Cost \$482,000. Cost \$1,415,000. Sulphuric acid plant constructed.
1957	Wilmington N.C. plant sold	

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1957	General Research Building and approximately 21 acres of land at Skokie, Ill. sold on a leaseback contract.	Administrative Center facilities under construction sold to U. S. Steel and Carnegie Pension Fund March 6, 1957. The sale for \$1,823,666 resulted in an after tax gain of \$713,350 and was treated as a special item on the P/L. The Administrative and Research Center was leased back for a term of 25 years from December 1, 1958 with renewal options for three periods of 10 years each. Annual rental was \$490,330 during initial term. Renewal terms at reduced rentals.
	Fairfax, Minn. plant built and put on lease-back.	Initial term 20 years from 4-1-57 with renewal options for six successive five-year terms. Annual rental \$28,348 during initial term.
	Saskatchewan potash development approved May, 1957	Board of Directors approved funds to start development, sinking of shaft and initial plant to be paid largely through loans to subsidiary from parent company.
1958	Stock option Plan C adopted October 22, 1957	Shareholders approved this plan reserving 90,000 shares for the granting of ten-year options to officers and key personnel. \$25.77 per share, exercisable beginning October, 1959.
	Common stock authorized increased October 22, 1957	Shareholders authorized increase in number of shares of common stock from 3,000,000 to 5,000,000 shares.
	Minquim Internacionales, S.A. acquired December, 1957	Acquired Mexican barite mineral deposits and some mining and exploration for for \$40,000 cash. Operated as 100% affiliate of parent company, organized 3-14-57 in Mexico.
	Pension plan changed February, 1958	Three insured pension plans, two of which were contributory, converted to two non-contributory trustee plans.
	Headquarters office moved to Skokie June, 1958	Moved Headquarters from 20 North Wacker Drive, Chicago, Ill. to newly completed facilities on 21 acres costing \$5.5 million.
	Florida Bonnie phosphate chemical facilities expanded	To produce granular triple superphosphate and fluorine products.
	Mineralogical Laboratory, Mulberry, Fla. completed	
1959	Montana phosphate properties sold	Sold for \$300,000.
	Revolving credit and term loan agreement	Entered into an agreement on 11-5-58 jointly with First National Bank, Chicago, Chemical Corn Exchange Bank, New York and J. P. Morgan & Co., Inc., New York for \$10,000,000 with right to convert into a five-year term loan on or before 10-1-61.
	Houlton, Maine plant sold	
	Custer, S.D. plant rebuilt	Feldspar plant destroyed by fire in July, 1958, rebuilt at cost of \$338,500 and in production in March, 1959.
1960	Montgomery, Ala. plant change in operations	Converted from fertilizer plant to warehouse for fertilizer materials.
	Bartlesville, Okla. fertilizer plant acquired August, 1959	Acquired for \$16,000 at bankruptcy sale.
	Louis Ware retired August, 1959	Chief Executive of corporation for 20 years. Continued as Chairman of Board of Directors.

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COMMENTS

1960	Miami Fertilizer Company acquired August 5, 1959	Operations consisted of plant in Dayton, Ohio. Acquired by issuance of 19,309 common shares at \$33.00 per share. Net assets acquired \$309,152, excess of consideration depreciated as fixed asset value. Miami liquidated, November 30, 1959.
	San Jose, Calif. plant expanded	Increased production 25% at cost of \$750,000.
1961	Catawba Fertilizer Co. liquidated July, 1960	IMC received from liquidation \$64,534 on 50% investment acquired in 1913 for \$25,000.
	Welcome Agricultural Chemical Co. acquired July, 1960	Fertilizer plants at Welcome and Marshall, Minn. purchased for \$15,000 cash.
	E. Rauh & Sons Fertilizer Co. acquired November, 1960	Issued 119,600 shares of common stock at \$33.00 per share valued at \$3,946,800. Net assets acquired \$3,954,962. Operated as 100% affiliate until dissolved 12-3-62. Fertilizer plants at Indianapolis, Plymouth and Sylvania, Indiana.
	Bioferm Corporation acquired February, 1961	Issued 80,000 shares of common stock at \$32.125 per share valued at \$2,570,000. Accounted for as a pooling of interests. Net assets acquired \$511,231.
	Industria Deshidratadora Sayeg, S.A. interest acquired	Mexican dehydration plant. IMC invested \$200,000 for 51% interest. Full production started 11-2-61.
	Houston, Texas grinding mill constructed April, 1961	To process barite supplied by Mexican subsidiary and from other sources. Cost \$550,000.
	International Minerals & Chemicals (Bahamas) Limited Incorporated May 11, 1961	Organized in Nassau, Bahamas. 100% subsidiary of IMC-Canada.
	Tennessee undeveloped phosphate reserves sold	Reserves in areas around Columbia and Centerville sold to Hooker Chemical Corp. and Phosker Realty Co., Inc. for \$8,290,000 cash. Net gain after taxes \$3,613,382.
	Rotary kiln, Bartow, Fla. constructed	For production of calcined rock. Cost \$1,433,000.
	Special write-off various small plants	Number of small plants closed permanently. Book values totalled \$4,026,000 after tax loss \$2,025,376.
1962	Tripoli, Iowa fertilizer plant acquired July, 1961	Cost \$40,000.
	Aristo Corporation acquired July 29, 1961	Producer of foundry resins acquired by issuing 21,176 shares of common stock valued at \$47.75 per share, a total value of \$1,011,154. Accounted for as a pooling of interests. Net assets acquired \$672,673.
	Senior promissory notes issued September, 1961	Borrowed \$40,000,000 from Prudential Insurance Co. of America to mature July 1, 1981. Annual principal payments of \$2,000,000 commencing July 1, 1966. Used \$10 million to retire revolving credit loan, \$5.5 million to pay off 3-1/4% term loan with Prudential.
	Incentive Bonus Plan formally adopted September 7, 1961	Approved by Board of Directors and effective 7-1-61.
	Union, Ill. fertilizer plant acquired November, 1961	Cost \$38,500.

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1962	Blooming Prairie, Minn. fertilizer plant acquired February, 1962	Cost \$47,500.
	The American Fertilizer Company organized March, 1962	Incorporated 3-27-62 in State of Delaware. Company formed for purpose of distributing plant food lawn and garden products under trade names other than used by IMC (parent).
	Esterhazy, Canada potash ore body reached June 8, 1962	First carload of test product shipped June, 1962. Official opening September 20, 1962.
	Noralyn phosphate plant, Fla. expanded	Major modernization program to expand production.
	Diammonium phosphate plant, Fla. constructed at Bonnie facilities	Completed at cost of \$3,200,000.
	Senegal, Africa phosphate interests acquired	Acquired 12% interest in COMPAGNIE SENEGALAISE DES PHOSPHATES DE TAIBA, ("Taiba" operator of phosphate mine near Dakar for approximately \$1,200,000. IMC guarantee of bank loan of \$1,958,000 made to this phosphate company.
	San Jose, Calif. plant converted to fermentation process	Conversion from CSF process to fermentation process to produce glutamic acid, the material from which Ac'cent (monosodium glutamate) is made, cost \$1 million.
	Husky Oil Company investment	Loaned \$3 million, interest free, for five years which was refinanced by bank loan guaranteed by IMC. IMC had right to 60% participation in phosphate reserves in Idaho held by Husky.
	Phosphate production (carved out interest) sold June 29, 1962	Agreement with Gibson Industries, Inc. for \$2,000,000 loan, secured by conveying and assigning 50% of phosphate rock to be produced and sold from our lands (E 3/4 of Sec. 33 Polk Co., Fla.) subject to agreement with Hercules Powder Co. Proceeds from sale after taxes were \$1,360,000. Deferred income for book purposes.
1963	Aristo Corporation dissolved July 1, 1962	Detroit, Michigan plant continues as Industrial Minerals Operations.
	Nitrogen venture - IMC and Northern Natural Gas Co. July, 1962	Formed Nitrin, Inc. to construct and operate a 400 ton per day capacity nitrogen plant at Cordova, Ill. Authorized capital \$3,500,000, 35,000 shares, par value \$100. IMC and Northern subscribed to 17,500 shares each.
	May Brothers, Inc. acquired July, 1962	Issued 44,000 shares of common stock at \$51.25 per share valued at \$2,255,000 for this drilling mud and lumber company. Accounted for as a pooling of interests.
	Mud Control Laboratories, Inc. acquired July, 1962	Issued 27,000 shares of common stock at \$53.50 per share valued at \$1,444,500. Accounted for as a pooling of interests. Another drilling mud operation.
	5-1/2% Subordinated Promissory Notes issued	Borrowed \$10,000,000 from Prudential. Notes mature July 1, 1982 with annual principal payments of \$250,000 starting July 1, 1963 through July 1, 1977 and \$1,250,000 on July 1, 1978 through July 1, 1981.
	E. Rauh & Sons Fertilizer Co. dissolved 12-3-62	November 30 date used for accounting purposes.
	Alamo Lumber Co. acquired November 27, 1962	Issued 75,348 shares of common stock at \$35.75 per share valued at \$2,693,691. Accounted for as a pooling of interests. Another drilling mud company.
	Fairgrove, Mich. fertilizer plant completed November, 1962	

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COMMENTS

1963

Fertilizer plants constructed in Applegate, Mich.,
Edmund, Wis., Elkton, Mich., and Middleton, Ind.

International Minerals & Chemical S.A.
ownership transferred

100% ownership transferred 12/62 from IMC (Canada) Limited to IMC
U.S. (parent company). Incorporated 11-11-59 in Panama.

Mud Control Laboratories, Inc. dissolved
February 1, 1963

Overseas Marine Services, Inc. organized
February 18, 1963

Under the laws of State of New York.

International Minerals & Chemical de France
organized April 16, 1963

Greenville, Tenn., mica plant sold May, 1963

Operations had ceased September, 1961.

Overseas Marine Services Limited organized
May 23, 1963

Under the laws of British Columbia.

The Dayton Oil Company acquired
April 9, 1963

Assets acquired for \$236,500 cash and operations taken over by Detroit foundry
operations.

Joint Venture India fertilizer plant
organized

Coromandel Fertilizers Ltd. formed by IMC with California Chemical Co. and E.I.D.
- Parry Limited of India. Plant costs estimated at \$68 million. Financing:
Export-Import Bank to lend \$27 million, Agency for International Development
\$17.5 million in equivalent Indian Rupees, remainder from public stock issue and
from the three partner companies.

1964

Amino Division split into two divisions -
Bioferm and Ac'cent International
July 1, 1963

Bioferm becomes producer and seller to food processing industry; Ac'cent the
seller to the retail and institutional users.

Supermud Sales Service, Inc. acquired
July 8, 1963

Certain assets acquired for \$20,000 cash. Taken over by Oil Well Drilling Mud
operations.

Redford Iron and Equipment Company acquired
July 26, 1963

Purchased for 3,111 shares of common stock at \$50.625 per share valued at \$157,494.

Bioferm Corporation dissolved July 31, 1963

Subsidiary dissolved. San Jose and Wasco plant to be operated as Bioferm Division.

Bourg Mud & Chemical Corporation acquired
Bourg Storage Company, Inc. acquired
Bourg Towing Company, Inc. acquired
Bourg Barge Line acquired

(
(Acquired for cash consideration of \$400,000
(all assets except for mud and chemical inventory.
(

Common stock dividend increased and extra

Declared an extra dividend of 20¢ per share and increased the regular quarterly
dividend from 40¢ to 45¢ a quarter, payable 9-30-63.

Prudential Insurance Company long-term debt
refinanced

Replaced the previously issued \$40 million senior promissory notes and the
\$10 million subordinated promissory notes with \$50 million senior promissory notes
at 5.35% due 10-1-83. Annual payment of \$1,000,000 on 10/1/68-72;
\$2,500,000, 1973-77; \$4,000,000 1978-82; \$12,500,000 due 10-1-83.

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COMMENTS

1964

Prudential Insurance Company \$28 million
5-1/2% Subordinated notes issued

Term 15 years. Annual payments of \$2,000,000 10-1-65 through 10-1-78.

Stock Option Plan "D" initiated
October 22, 1963

Reserved 80,000 Common shares for the granting of options during ten-year period to officers and key employees at a price of 100% of market value at time option is granted. Options expire five years from date of grant.

Second potash shaft at Esterhazy, Saskatchewan
started

October, 1963.

Nitrin, Inc. started production

Nitrogen plant started producing at Cordova, Ill. jointly owned with Northern Natural Gas Co.

Apex Mining Company, Inc. acquired
December 2, 1963

Purchased this Mineral Point, Missouri firm for 4,527 shares of Common stock at \$62.25 per share valued at \$281,805.75. Apex was a barite miner, a product used in drilling mud. Apex Mining Company, Inc. dissolved 11/12/66.

3.65% Subordinated Convertible Debentures
converted or redeemed

Called for redemption on 3/25/64 at 101-3/4% of the principal amount plus accrued interest to 3/25/64 amounting to \$1,026.02 for each \$1,000 principal amount. Holder could also convert into common shares at \$56 a share, through 3/20/64. Debentures in principal amount of \$14,537,000 converted into 259,220 shares of common. Bonds in principal amount of \$162,000 were redeemed for cash. Fractional shares resulting from conversion were paid in cash.

Esterhazy potash expansion

Compactors installed to boost granular production 175%, overall production at refinery 20%, new drying facilities and equipment to make white potash crystals for Japanese market. Cost \$2.8 million.

California Cattle Supply Co. acquired
May 14, 1964

Purchased for 5,809 shares of common stock valued at \$68 per share at cost of \$395,012 to operate as 100% affiliate of IMC. Incorporated 5-25-62 in State of California.

Ac'cent International de Mexico S.A. de C.V.
organized

Incorporated and organized under laws of Mexico.

Research and Development Center site purchased
May 26, 1964

Purchased 296.399 acre farm at \$1,500 per acre near Libertyville in Lake County, Ill. as site for new Research and Development Center. Total cost \$456,500 including legal, survey, etc.

Prudential Insurance Company -
\$80 million Note Agreement, 5.35% interest rate
IMC Parent
\$45 million Note Agreement, 5.5% interest rate
IMC-Canada

Corporation and Canadian subsidiary each completed new long-term agreements with Prudential. IMC-Canada drew down \$30 million which was used to repay outstanding loans from IMC. Parent company repaid \$28 million of long-term debt outstanding to Prudential and \$50 million of the \$80 million loan to IMC was used to refinance \$50 million of long-term debt outstanding to Prudential, leaving \$30 million to be drawn down during 1964-65. \$80 million to be repaid \$2.75 million 10/1/68-72; \$4.5 million 10/1/79-88; \$4.75 million 10-1-89; \$45 million to be repaid \$3.0 million 10/1/68-82.

1965

International Minerals & Chemical (Hong Kong)
Limited Organized

Incorporated and organized under laws of Hong Kong.

Common stock dividend increased

Regular quarterly dividend raised to 50¢ from 45¢ per share payable 9-30-64.

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EVENT

COMMENTS

1965

International Minerals & Chemical (A.N.Z.) Pty
Limited organized

Incorporated and organized under laws of Australia.

Common stock authorized increased and
common stock distribution

Shareholders authorized increase of common stock from 5,000,000 to 10,000,000 shares. 100% Common stock distribution (1 for 1 basis) on 11-27-64 to holders of record 11-4-64.

Stock Option Plan "D" amended

Amendment to increase by 100,000 shares to bring total reserved common shares to 180,000 shares. Adjusted for 1 for 1 stock distribution to 360,000 shares.

Series Preferred Stock - new class authorized

Authorized issuance of 500,000 shares, par value \$100, at discretion of Board of Directors.

Top management changes

Louis Ware, Chairman of the Board, retired. T. M. Ware, President, elected Chairman of the Board. N. C. White elected President.

IMC Development Corporation incorporated

Incorporated and organized under the laws of State of Delaware to carry on mining and exploration activities.

May Brothers Lumber Co., Inc. subsidiary
sold

Sold lumber business to May Brothers, Inc. for \$425,000. Received \$50,000 at closing and note for balance.

Genoa, Nebraska fertilizer plant acquired

Assets acquired from Gro-Mor Fertilizer Company Inc. for \$133,855 cash.

IMC Italia, S.p.A. organized

Incorporated and organized under laws of Italy.

IMC Phosphate Terminal Company organized

Incorporated and organized under laws of State of Florida.

Florida Phosphate Terminal Corporation acquired

Purchased for 25,323 shares of common stock at \$55.00 per share at cost of \$1,392,765 and prior cash investment of \$314,066 totaling \$1,706,831. Operated as 100% subsidiary, IMC Phosphate Terminal Company.

Chlor-Alkali plant site purchased

Purchased 140 acres of land at cost of \$88,225 along Penobscot River in Orrington, Maine. Sold 16 acres to IMC Chlor-Alkali, Inc. for \$16,060. IMC Chlor-Alkali was a joint venture of IMC (34.41%), Bangor Hydro-Electric Co. (19.67%), Penobscot Company (19.67%), Darbury Chemical Corporation (19.67%), and Francona Paper Company (6.58%) formed 4-20-66 for the purpose of the construction and operation of a chlorine and caustic soda plant at Orrington, Maine.

Industria Deshidratadora Sayeg, S.A.
100% ownership

IMC purchased remaining 49% outstanding interest from Alfred Sayeg for \$29,500. Original investment in February, 1961. Now 100% owned IMC subsidiary.

Bartlesville, Oklahoma, plant closed

Operations terminated, all assets transferred or sold. Plant operated since August, 1959.

Florida Bonnie Phosphate Chemical Plant expansion

\$8.8 million for completion of new phosphoric acid and ammonium phosphate units increasing production capacity by 1/3 this year. Capacity of plant tripled in last four years.

1966

Duncan Supply Company Ltd. acquired by
IMC (Canada) Ltd.

Purchased net assets for \$75,000 cash to extend IMC direct sales of drilling muds into Canada. Company in Alberta, Canada.

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COMMENTS

1966

Wales, Tennessee plant shut down

Tricalcium phosphate plant shut down because of complaints from farmers about alleged air pollution. Plant operating in Giles County since 1914.

Alamo Lumber Company, Inc. subsidiary sold
August 27, 1965

Sold lumber business for \$3,436,582.27. Paid at closing \$1,150,000.00 and note for balance.

Common stock dividend increased

Regular quarterly dividend increased to 30¢ from 25¢ per share payable 9-30-65.

Ken Corporation acquired September 1, 1965

Purchased by issuance of 35,649 shares of common stock at \$50.625 per share at a value of \$1,804,730 for all Ken's outstanding capital stock.

Esterhazy expansion completed

\$3.5 million expansion completed in September, 1965 raising potash annual production to 2 million tons from 1.6 million tons.

Ken International, S.A. 60% affiliate acquired
November 2, 1965

Purchased by issuance of 351 shares of common stock at \$50.625 per share at a value of \$17,769.38. In addition, 10% of outstanding capital stock was acquired by IMC on 9-1-65 upon liquidation of Ken Corporation into IMC giving IMC 70% ownership of this drilling mud company.

4% Subordinated Debentures due 1-1-91

Sold through underwriters \$50 million par value convertible debentures. Price to public 102% \$51,000,000, proceeds to IMC \$50,437,500. Underwriters discount 1-1/8%, or \$562,500. Sinking fund payments begin 1-1-77.

Ken de Mexico, S.A. dissolved March 1, 1966

100% Subsidiary dissolved. Acquired 9-1-65 with Ken Corporation.

Universal Bulk Shipping organized

Formed with Global Bulk Transport on a 50/50 basis to operate a cargo vessel "Nelson C. White" for the transport of potash from Vancouver to East Coast ports.

Carved out interest Carlsbad

Future potash production sold for \$7 million. Conveyed 45% of production from all state and federal leases in Eddy County, between IMC, Quadrangle Foundation, Inc. and First National Bank of Chicago.

1967

East Point, Ga. plant closed

Minor element operations transferred to Tupelo, Miss. plant.

Fred'k A. Stresen-Reuter, Inc. acquired
August 22, 1966

Issued 17,000 shares common stock at \$65 per share 6-22-66 on N.Y.S.E. Accounted for as a pooling of interests. Net assets recorded \$799,473.

Common stock dividend increased

Regular quarterly dividend increased to 37-1/2¢ from 30¢ per share payable 9-30-66.

Tennessee properties sold
September 30, 1966

Sold to Stauffer Chemical Co. all phosphate minerals and chemical properties (real estate, buildings, machinery and equipment and ore reserves) for \$700,000 resulting in gain of \$569,403, tax free from utilization of available capital loss carry forward.

Industrial Chemicals Division formed

New division formed to expand production and sales of chlorine, caustic soda, caustic potash, potassium carbonate and refined potassium chloride.

Increase in common stock authorized

Shareholders, on October 25, 1966, authorized increase of common stock to 15,000,000 shares from 10,000,000 shares.

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COMMENTS

1967

Kingsford, Florida phosphate minerals plant completed

First shipments made 10-4-66 although plant still in start-up period. When completed phosphate rock production will be increased by 33% to 8 million tons a year.

Research Science Center completed

Land and buildings situated at Libertyville, Illinois cost \$6.5. million. Dedication of facilities held October, 1966.

Common stock distribution

50% Common stock distribution (1 for 2) on 11-25-66 to holders of record date 11-2-66.

E. J. Lavino & Company acquired December 1, 1966

259,243 Shares Series A Convertible Cumulative Preferred stock (par value \$100 per share and convertible into common at \$50 per share) issued in exchange for assets - plus 3-year 6-1/2% non-prepayable promissory note for \$100,000 of E. J. Lavino & Company. Producer of refractory materials for steel industry.

Husky Oil Company/IMC Joint Venture sale December, 1966

Sale to third party of Idaho phosphate deposits held under Federal leases by Husky in joint venture with IMC.

Azufrera Intercontinental S.A. de C.V. interest acquired

A 34% interest acquired in Azufrera Intercontinental, a Mexican company which has applied for a concession to explore for and develop sulfur.

Rainbow Division outlets opened

Opened 20 small blending plants and distribution facilities in the Midwest and Southeast during the year.

Archbold, Ohio and Belvidere, Ill. plants began operation

Two new plants provided Customix molding sand additives to principal areas of the Midwest.

Colony, Wyoming bentonite plant constructed

New bentonite mill at Colony, Wyoming doubled capacity of plant closed at Belle Fourche, S. D.

Animal feed phosphate plant completed March, 1967

New animal feed phosphate plant began production at Bonnie complex. Capacity of 500,000 tons annually.

K-2 Mine opened April, 1967

Second shaft at Esterhazy completed for \$60 million with capacity of 1.5 million tons per year. Including K-1, total potash capacity at Esterhazy was 3-1/2 million tons per year.

By-laws amended

Amended to designate President as Chief Executive Officer of Corporation.

New Chief Executive Officer May 26, 1967

Nelson C. White, President, named CEO by Board.

Plant Food Division assets sold June 22, 1967

Plant Food Division facilities at Sylvania, Ohio and Woburn, Mass. authorized to be sold.

California Cattle Supply Company dissolved

Liquidation and dissolution of wholly-owned subsidiary of IMC.

1968

Wasco, Calif. Research Laboratory closed

Consolidation of all IMC biological R & D activities at new Growth Sciences Center in Libertyville, Ill.

Wasco, Calif. plant closed August, 1967

Animal feed plant production to be phased out over eight month period.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1968	R. A. Lenon elected officer September, 1967	Richard A. Lenon, formerly Vice President and Treasurer, returns to IMC from Westinghouse Airbrake Company and elected Group Vice President-Administration.
	Village Inn Gourmet Foods, Inc. acquired September 12, 1967	Assets acquired for 13,333 shares of IMC common stock. Plant in Geneva, Ill.
	Phosphate discovery - Australia	IMC announced discovery of large phosphate deposit in northeastern Australia. A joint venture agreement was signed in May of 1968 with AFL Holdings, Ltd. of Australia. AFL is operator of the joint venture, maintaining the mineral rights according to Australian law. No commercial development has taken place.
	T. M. Ware retired October 24, 1967	Thomas M. Ware retired as IMC Chairman and Director.
	Revolving credit	IMC Board approved 10/24/67 loans under a revolving credit agreement with eight banks due 11/20/70 with interest at 1/4% above lenders' prime rate (6-3/4% at 6/30/68).
	Prudential loan refinanced	\$100 million 5.75% loan from Prudential Insurance Company dated 12/1/67 due 12/1/92. The agreement called for 2 closings, at the first, 12/1/67, notes of \$90 million were issued in exchange for the cancellation of an \$80 million 5.35% note due Prudential, and at the second closing, 6/2/69, notes of \$10 million were to be issued to Prudential.
	Morton/IMC merger announced then terminated	On December 6, 1967, announced agreement in principle with Morton International regarding merger or consolidation. On June 28, 1968, plans were abandoned when Morton decided not to join IMC in opposing Department of Justice inquiry to delay consolidation.
	Agriidco formed January, 1968	Five companies (including IMC) formed consortium for agro-industrial development in Dominican Republic: Agro-Industrial Development Company, S.A.
	Azufrera Intercontinental S.A. de C.V. interest sold February 28, 1968	IMC sold one-half of its 34% interest in this Mexican sulphur joint venture to Ashland Oil Refining Corporation.
	Evangeline Pepper & Food Products, Inc. acquired April 15, 1968	Property and assets of Evangeline acquired for 21,930 shares IMC common stock. Producer of 17 Louisiana condiments and southern vegetables.
	Indianapolis, Ind. plant sold April 30, 1968	
	Northwest Olivine Company acquired May 23, 1968	Property and assets of Northwest Olivine Company, Seattle, Wash. acquired in exchange for 178,858 shares of IMC common stock.
	IMC-Chlor alkali plant began operation	Plant in Maine, commercial producer of chlorine and caustic soda for pulp and paper industry.
	Forafluid, S.A. investment made	Acquired a majority interest in this French drilling mud company.
	"Dumping" charge against IMC-Canada	U. S. Customs Bureau tentatively determined that Canadian potash producers, including IMC-Canada, were "dumping" potash into the United States. Subsequent clarification in 1970 by the U.S. Treasury Department of the basis for assessment of potential duties indicated IMC would not be subject to any substantial liability.
	Chemicals, Inc. acquired June, 1968	Assets of Chemicals, Inc., Bartow, Florida, a producer of sulphuric acid, acquired for 73,338 shares IMC common stock and 40,000 shares new IMC Series B 5% cumulative, convertible preferred stock.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1968	Continental Ore Corporation merger occurred	COC merged into IMC. 900,000 Shares of IMC common and 200,000 shares of new Series C cumulative preferred exchanged in transaction for this privately-held international trading company headquartered in New York City. The largest growth move in IMC's 59 year history, adding \$140 million in sales and \$3.3 million in earnings.
1969	Dividend reduction	Common stock quarterly dividend reduced from 25¢ to 12-1/2¢ payable 9-30-68.
	Authorized stock increased	Shareholders authorized increase in common stock (\$5 par value) from 15,000,000 to 20,000,000 shares and series preferred stock (\$100 par value) from 500,000 to 1,000,000 shares.
	Merger between IMC/Williams announced then terminated	In October, 1968, announced agreement in principle to merge the two companies. On November 11, 1968 a joint announcement was made terminating merger discussions by mutual agreement.
	IMC/Mobil property exchanged	Exchange of Polk County phosphate properties in Clear Springs, Fla.
	Clear Springs mine purchased	Purchased for \$5.5 million phosphate mining and processing facilities near Bartow from Mobil with capacity of 2 million tons annually.
	IMC Drilling Mud, Inc formed January 1, 1969	Assets of Drilling Mud Division transferred to new affiliate. 50% interest purchased by Halliburton for approximately \$16.9 million.
	Bonnie, Florida sold February 11, 1969	Central Farmers Fertilizer Company (CF Chemicals, Inc. subsidiary) purchased Bonnie chemical complex for \$29 million, of which \$26 million was used to reduce long-term debt.
	R. A. Lenon elected Director April 22, 1969	Richard A. Lenon elected Executive Vice President and Director of IMC.
	Wasco, Calif. plant sold May 7, 1969	Fermentation plant sold to Transocean Chemical Company, subsidiary of Gulf Oil Company, for \$850,000.
	Dividend omitted	Quarterly dividend on common stock payable 6-30-69, omitted.
	Ac'cent International plant sold	Sold Chicago, IL Ac'cent packaging plant located on Iowa Street. Operations moved to Geneva, IL.
	Rainbow Division plants to be sold	Up to 50 retail fertilizer distribution facilities authorized for sale or lease.
1970	Aberdeen, Miss. plant opened October, 1969	\$1 million bentonite mine and plant opened replacing old plant nearby.
	Saskatchewan potash regulations issued January 1, 1970	Government of Saskatchewan issued regulations designed to conserve potash resource within the province. Production was allocated and a minimum price established.
	New Chairman and President elected January 7, 1970	Nelson C. White elected Chairman of the Board. Richard A. Lenon elected President and Chief Operating Officer.
	Lavino's Lynchburg plant sold January, 1970	Blast furnace sold for approximate book value.
	Achan, Florida, facilities sold April 22, 1970	Sale of phosphate processing facilities and 95 acres of land at Achan to Mobil Oil Corp.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1970

SCAN Explorations, Ltd. formed May 21, 1970

Joint Venture (IMC-Canada and Barkroy Explorations, Ltd.) formed to seek out mineral deposits in Canada.

Great Lakes Container Corporation acquired June 5, 1970

Acquisition through stock purchase, including 74,996 shares of common stock, of Great Lakes Container Corporation, Detroit, MI.

Northwest Carolina Olivine Company dissolved

Wholly-owned subsidiary of IMC dissolved.

Nitrin, Inc. shutdown, Cordova, Ill.

Joint venture of IMC and Northern Natural Gas shut down in June. Each partner assumed \$6.4 million debt at 5.25% maturing 6-30-80.

1971

Investment Plan for Salaried Employees began July 1, 1970

Covered all U.S. exempt employees.

Wisconsin Foundry Products, Inc. acquired July 10, 1970

Nitric Acid Plant, Cordova, Ill. sold July 17, 1970

Nitrin's nitric acid plant sold to Escambia Chemical Corp. for \$400,000.

Lakeside Plastics Corporation acquired July 27, 1970

Assets of Lakeside Plastics Corporation, Oshkosh, Wisconsin, acquired for \$250,000 cash and notes for \$396,000.

Nitrin Urea Plant, Cordova, Ill. sold July 30, 1970

Sold to Skelly Oil Company for \$100,000.

"Nelson C. White" cargo vessel sold

50% interest in vessel "Nelson C. White" sold in July for approximately \$3.3 million.

Phosphate Rock Export Assoc. (PHOSROCK) and Canadian Potash Export Assoc. (CANPOTEX) formed

PHOSROCK was formed by U.S. phosphate rock producers to handle export sales of that product. CANPOTEX, an organization of Saskatchewan potash producers, was formed for the handling of export sales (excluding the U.S.) of potash produced in Saskatchewan.

Eufaula Bauxite Mining Company acquired August 14, 1970

Acquired from National Properties & Mining Co., Inc. for \$650,000.

37% equity in Sobin Chemicals acquired September 17, 1970

Equity portion was acquired through (1) exchanging IMC potash chemical business; (2) purchasing Sobin common stock, and (3) selling IMC's interest in IMC Chlor-Alkali, Inc. The total transaction was \$4,000,000.

Carnforth Limited established October 1, 1970

Incorporated wholly-owned subsidiary to carry on general insurance business under laws of Bermuda.

Nabor Industries, Inc. and American Metal Barrel Company acquired October 7, 1970

Acquired two drum reconditioning businesses in St. Louis, Missouri, for 108,604 shares IMC common stock.

Revolving credit

\$40 Million revolving credit and term loan authorized.

ESFAC (Esso Standard Fertilizer & Agricultural Chemical Company) purchase/resale November 24, 1970

Purchase of ESFAC, a Philippine fertilizer producer, by Continental Fertilizer Corporation (COC subsidiary) and resale to SPCMA (Sugar Producers' Cooperative Marketing Assoc., Inc.) at profit of \$1.4 million before taxes.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1971	Northland Chemical Company acquired December 2, 1970	Purchase of 71% of voting stock of Northland.
	Christopher Industries, Inc. and Acme Service Container Co. acquired January 21, 1971	Assets of two container businesses acquired for \$250,000 plus 41,889 shares of IMC common stock.
	Prudential loan refinanced February 26, 1971	Loan agreement with Prudential Insurance Company of America for \$100 Million, 6.65%, due 12/1/92, refinanced 5.75% notes due Prudential 12/1/92.
	G. D. Kennedy elected Executive Vice President March 24, 1971	
	Sims Barrel Company, Inc. acquired April 1, 1971	Assets of container company acquired for \$1,160,000.
	Marion Manufacturing Company interest acquired April 2, 1971	50% Equity interest in Indianapolis, Ind. company purchased from The Borden Company bringing interest held by IMC to 100%.
	Sale of potash mineral reserves to Amax Potash Limited (AMAX) May, 1971	Terms of sale were \$3 million in cash with the balance due, \$1 million, annually over nine years plus interest at 7% (Canadian dollars). Sale covered reserves estimated to contain 90,000,000 tons, or 10% of IMC-Canada's total recoverable potash ore. In conjunction with this sale IMC-Canada entered into a service agreement with AMAX to produce specified quantities of potash annually for AMAX. The initial term of the agreement expires in 1981, and is renewable at the option of the buyer for six additional five-year periods.
	IMC Development Corp. (Fla.) formed June 29, 1971	This land development company formed to operate in Florida and to administer property interest not being mined.
	Chicago Heights plant closed June, 1971	
1972	R. A. Lenon elected new CEO	Richard A. Lenon replaced Nelson C. White as Chief Executive Officer.
	Industrial Products reorganized	Industrial Products Division reorganized into four units: Containers, Ceramics, Foundry and Stresen-Reuter.
	Dividend declared	5¢ quarterly dividend declared on common stock payable 9-30-71. First dividend since March, 1969
	Corporate headquarters move from Skokie to Libertyville September 1, 1971	IMC leasehold interest in Skokie sold and assigned to Brunswick Corporation. IMC offices relocated to IMC Plaza, remodeled five-year old research and development center. Move completed by June, 1972.
	Ac'cent International Division sold October 1, 1971	Assets and business of Ac'cent International sold to Wm. Underwood Co. of Watertown, Mass. for cash and notes of approximately \$12,000,000 plus royalties.
	IMC Drilling Mud, Inc. interest sold January 14, 1972	Purchase from IMC by Halliburton Company of remaining 50% interest in IMC Drilling Mud, Inc.
	Lakeside Plastics Corporation sold January 31, 1972	Assets acquired 7-27-70 sold for \$20,525 cash and \$50,000 of notes.
	Arizona Cattle Supply Company acquired	Assets of Arizona Cattle Supply Company purchased for \$425,000.
	Dividend increased	Quarterly common stock dividend increased from 5¢ to 8¢ per share payable 6-30-72.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1972	Revolving credit agreement cancelled May, 1972	Cancelled revolving credit agreement. Current financing to be handled through short-term bank lines.
	OK Syndicate Joint Venture	Purchased a 25% equity interest in this small British Columbia copper mining venture for approximately \$2 million.
	Acquisition negotiations terminated	Negotiations were terminated related to UMC Industries (did not fit Corporate objectives); Southwestern Illinois Coal Corporation (went to higher bidder).
	Wisconsin Foundry Products, Inc. sold	L. O. Smith Foundry Products Co. acquired the assets of this business.
1973	Stresen-Reuter International sold August 16, 1972	Lawter Chemicals, Inc. acquired assets and business of Stresen-Reuter International (division of IMC) for 87,386 shares of Lawter common stock.
	IMC Common Stock purchase	Announced intent to purchase up to 200,000 shares of IMC common stock to be held in treasury for possible acquisitions and exercise of stock options.
	Cor-Plex International acquired September, 1972	58% Interest in Cor-Plex acquired for cash. Acquired were Gibson Electric Company, Gerson Electrical Construction Company, both of Chicago, and Ken-Com Corp., Milwaukee, Wis.
	Custer, South Dakota, plant sold October 11, 1972	IMC Custer plant sold to Pacer Corporation for \$750,000.
	Dividend increased	Quarterly common stock dividend increased from 8¢ to 10¢ per share payable 1-2-73.
	Ottjase Mining Co., Ltd. interest acquired	Continental Ore acquired 23.75% in an African copper mining venture.
	IMC Chemical Corp. formed February 7, 1973	Creation of subsidiary for production and sale of phosphate chemicals, a new Florida P ₂ O ₅ plant with expected construction costs of \$90 million.
	Loan negotiated April 18, 1973	Prudential Insurance Company of America and various banks: \$52 million, 8-1/4% - due 6-30-83, for New Wales P ₂ O ₅ plant. The total loan will be made over up to eight closing dates.
	Kingston Steel Drum Corp acquired May 4, 1973	Acquired Kingston drum reconditioning company through IMC subsidiary (Great Lakes Container Corp.) for \$550,000.
	Rhenium operation discontinued June 1, 1973	An extraordinary charge of \$2,435,000 was made in connection with the closing and disposition of this Golden, Colorado operation.
	Nitrin, Inc. sold and liquidated June 29, 1973	Assets sold to Northern Gas Products Company and company liquidated.
1974	Retirement benefits increased July 1, 1973	Increased pension benefits to persons retired before 7-1-72 and receiving less than \$5,000 per year.
	IMC International formed July, 1973	IMC International created providing agricultural operations with a worldwide off-shore marketing, trading and distribution arm.
	Performance Share Plan adopted	New Performance Share Plan for IMC officers adopted.
	Crop Aids Products business sold July 2, 1973	IMC's Crop Aid Products business sold to Sandoz-Wander, Inc. for approximately \$250,000.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1974	Sobin ownership increased July 3, 1973	Acquisition by IMC of 1,428,358 shares of Sobin common stock increasing ownership from 37% to 80.77% for a total of 2,113,000 shares. IMC transferred ceramics and glass products businesses along with net cash payments of \$2,331,000.
	SAMAF interest acquired July 20, 1973	Acquisition by IMC-Canada of 49% interest in SAMAF (Societe Auxiliare du Manganese de Franceville), and thereby indirect minority interests in COMILOG and MIFERMA, for approximately \$4,700,000 cash and \$1,500,000 notes. Joint venture with Paribas in manganese ore mining in Gabon and iron ore mining in Mauretania.
	Chemical Leaman Tank Lines, Inc. interest acquired	Purchase of 26% of common stock of Chemical Leaman as investment for \$5,500,000 cash.
	Dividend increased	Quarterly common stock dividend increased from 10¢ to 13¢ per share payable 9-30-73.
	Nepheline Syenite expansion began	Expansion begun in September, 1973 at Blue Mountain, Ontario to increase production by 40% at a cost of \$1,400,000.
	Corporate offices sold October, 1973	IMC Plaza offices and 300 acres of land in Libertyville sold to Paine and Sutherland for \$8.8 million cash and leased back for five years. A gain of approximately \$3.0 million was recorded.
	Stock Option Plan E adopted	Approved by shareholders at annual meeting.
	Salaried Retirement Plan amended November 1, 1973	Retirement at age 62 without reduction in amount of pension because of early retirement.
	D. F. Farrell Sons, Inc. acquired November 15, 1973	Acquisition of Farrell located in Coventry, R.I., by IMC subsidiary (Great Lakes Container Corp.) for approximately \$627,000. Drum reconditioning plant.
	Salaried Retirement Plan amended December 5, 1973	Provision for "bridging of service" credit for former employee returning to Corporation.
	Lavinosa mineral rights acquired	Purchase of South African mineral rights for \$1.5 million extended chrome mine reserves to 40 years.
	Prudential loan refinanced	Prudential Insurance Company of America refinanced \$100 million - 6.65% notes with \$140 million - 7.45% notes with sinking fund payments of \$7.5 million commencing in 1978 and a final payment of \$20,000,000 in 1994.
	Dividend increased	Quarterly common stock dividend increased from 13¢ to 25¢ per share payable 3-30-74.
	Port Maitland, Ontario plant acquired February 28, 1974	IMC-Canada purchased Port Maitland agricultural fertilizer and animal feed plant from ERCO Industries Limited for \$14.5 million. Capacity of 87,000 tons of phosphoric acid annually.
	Lavino Division refractories plants sold March 5, 1974	Kaiser Aluminum & Chemical Corporation purchased Lavino's two basic refractories plants (Plymouth Meeting, Penn. and Gary, Ind.) for \$2 million cash and \$14 million in notes.
	Commercial Solvents Corporation tender offer made March 7, 1974	First cash tender offer for up to 700,000 shares of CSC common at \$30 (net) per share at expiration date of 3-22-74. 1,142,546 shares tendered, or 37.3%. Cash paid \$35,200,000.

YEAR ENDED
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EVENT

COMMENTS

1974

Cor-Plex International Corp. sold
March 31, 1974

Cor-Plex sold for a loss of approximately \$4.1 million.

COC Metals Trading operations sold
April 1, 1974

COC Metals trading and certain other activities sold, a portion to former COC officers. Sale price, \$12,309,000.

Eufaula Bauxite Mining Company sold April 1, 1974

Mining operation sold for cash and mineral rights to North Carolina Olivine.

Retirement policy for officers adopted

Policy adopted on mandatory retirement at age 62 for corporate officers.

Ashtabula, Ohio, chlor-alkali plant
acquired May 31, 1974

Sobin Chemicals, Inc. (80% owned IMC affiliate) acquired Ashtabula, Ohio chlor-alkali plant from Dextrex Chemical Industries, Inc. for \$5,400,000.

Phosphoria mine expanded

A two million tons per year phosphate mine constructed at a cost of \$20.1 million

Second tender offer for Commercial Solvents
Corporation made June 28, 1974

Second tender offer for up to 300,000 shares of CSC common at \$30 (net) per share at expiration date of 8-2-74. 284,000 shares tendered, or 9.3%, increasing ownership to 46.6%. Cash paid \$8,800,000.

Dividend reinvestment program adopted

The Corporation made available to U.S. holders of IMC common stock a service to automatically reinvest dividends in additional IMC shares.

1975

Retirement benefits increased

Increase in pension benefits to persons retired before 1-1-74.

New Saskatchewan potash reserve tax implemented

Saskatchewan government imposed a new potash reserve tax, not deductible on the Canadian federal income tax return.

Amax Carbon Products, Inc. and
International Calciners, Inc. acquired
July 2, 1974

Purchase by IMC of all capital stock of Amax Carbon Products, Inc. and common stock of International Calciners, Inc. from American Metal Climax, Inc. for \$8.4 million. A new corporation was formed under the name of Republic Carbon Products, Inc.

Drum Service, Inc. acquired July 10, 1974

Acquisition of Drum Service, Inc. by IMC subsidiary (Great Lakes Container Corporation) from Paul J. Glass for \$700,000.

Sterlington, La. plant construction announced

Plans to build ammonia fertilizer plant in Sterlington, La. announced.

Dividend increased

Quarterly common stock dividend increased from 25¢ to 32¢ per share payable 9-30-74.

Tennessee Alloys Corporation and Tennessee
Metallurgical Corporation acquired
August 14, 1974

TAC and TMC, producers of ferrosilicon, acquired for approximately \$7,250,000.

M. C. White retired as Chairman October 2, 1974

IMC Exploration formed October 10, 1974

IMC and Commercial Solvents Corp. form new company for exploration of hydrocarbon supplies and acquisition of gas and oil producing properties.

Chemical Leaman Tank Lines, Inc. acquisition
negotiations terminated December 4, 1974

IMC had acquired 26% interest in 1973 and in early 1974 announced negotiations to acquire the remaining 74%. Negotiations now terminated.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1975

Stock split and dividend increased

One share common stock for every three shares held. Quarterly common stock dividend increased from 24¢ to 32¢ adjusted for split shares payable 1-2-75.

Chinhae Chemical Company, Ltd. acquired
December 23, 1974

Purchased 1/2 of Gulf Oil (Great Britain) Limited's equity interest in Chinhae's. Class A shares for \$7.5 million. Represented 25% ownership of entity.

Justice Department antitrust investigation
of potash industry January 23, 1975

IMC served with first subpoena in connection with antitrust investigation of potash industry by Justice Department.

Orrington, Me. chlor-alkali plant expanded

Project completed in January for \$1.6 million to expand production by 20% through the addition of four cells.

Sobin Chemicals, Inc. remaining interest
acquired March 5, 1975

Acquisition of remaining interest (approximately 19%) in Sobin (508,941 shares) by IMC for \$12,500,000 cash.

Commercial Solvents Corporation merged into IMC
May 15, 1975

Cash merger, \$75.6 million tender offer for remaining 54% of CSC stock, a producer of specialty chemicals for industry, agriculture, and human use, domestically and abroad. For the twelve months ended 6-30-75 CSC sales totalled \$173 million and earnings \$15.7 million; largest growth move in IMC's 66 year history. Total investment including expenses of \$119.6 million.

Dividend increased

Quarterly common stock dividend increased from 32¢ to 50¢ per share payable 6-30-75.

Stock delisted/listed May, 1975

Stock delisted from Toronto Stock Exchange and listed on Pacific Stock Exchange.

Petroleum Coke Storage facilities expanded

Coke storage capacity expanded at Long Beach, Ca. by installing coke crushing equipment and leasing a 30,000 ton outdoor storage facility for 10 years. Fixed capital and lease costs were \$4.1 million.

Allegheny Ludlum Industries, Inc./IMC
Joint Venture announced

IMC/Allegheny Ludlum Industries, Inc. joint venture formed to build \$34 million ferrosilicon furnace facility at Bridgeport, Ala. Allegheny held 25% interest.

Chemical Group formed

IMC Chemical Group formed consisting of Sobin Chemicals, Inc. and Commercial Solvents Corp.

Series B and C preferred stock redeemed
June 27, 1975

All outstanding Series B and C preferred stock redeemed at \$104.50 per share.

Aristo/Redford consolidated

Consolidation of operational headquarters and Detroit area manufacturing after acquisition of 8 acres of land and buildings. Capital investment of \$3.8 million.

IMC Terminal land purchased

Land on which IMC Terminal located purchased for \$4.5 million. Ten-year lease expired 6-30-75.

Great Lakes Container Corporation merged

Great Lakes Container Corporation, a 100% owned subsidiary, merged into IMC.

Interest in Taiba phosphate mine in Senegal,
West Africa sold

Recorded a \$4.9 million pre-tax gain, \$2.5 million net of tax, on sale of Taiba stock, originally purchased in 1962.

1976

IMC Industry Group formed

IMC Industry Group was formed in fiscal 1976 combining ferroalloys, carbon, foundry and container operations.

NYMA/Holland acquired by Sobin
July 22, 1975

Sobin Chemicals, Inc. purchased shares of NYMA N.V., Nijmegen, Holland, manufacturer of specialty chemicals, for \$4,300,000 cash.

YEAR ENDED
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EVENT

COMMENTS

1976	Production began October 1, 1975 New Wales Chemicals	This \$106 million concentrated phosphate chemical facility near Mulberry Fla. began commercial production. Capacity was 600,000 tons of P_2O_5 per year. Financed by variable interest bank loans and 8.25% notes from Prudential due in 1988; secured by take or pay contracts with 6 buyers.
	Certificate of Incorporation and By-Laws amended October 1, 1975	Number of authorized shares of IMC common stock, par value \$5 per share, increased to 50 million. Size of Board of Directors increased to a maximum of 16. Number of authorized shares of Series Preferred Stock, par value \$100 per share, reduced from 1 million to 192,743 shares. Conversions into common stock reduced this number to 120,000 shares during the year. New class "Second Series Preferred Stock" consisting of 3 million shares, par value \$1 per share authorized.
	New Directors elected October 9, 1975	A. E. Cascino, G. D. Kennedy, W. S. Leonhardt, R. C. Wheeler (IMC officers) elected directors.
	9.35% Sinking Fund Debentures issued Due 11-1-2000	IMC sold through underwriters \$100 million par value sinking fund debentures. Price to public 100% - proceeds to IMC \$99,125,000 - underwriter's discount \$875,000 - sinking fund payments begin 11-1-86.
	Port Maitland, Ontario, plant expanded	Renovation and expansion to a capacity of 130,000 tons annually of phosphoric acid completed in December for \$1.9 million.
	Otjifase Mining Co., Ltd. interest sold	Sold interest in this African mining venture for a \$864,000 loss.
	Exploration Agreement - Province of New Brunswick	Agreement signed 1-21-76 with Province of New Brunswick granting IMC-Canada potash exploration rights in Salt Springs area.
	IMC Phosphate Terminal Company merger January 31, 1976	Merged into IMC.
	A-M-Y Limited established February, 1976	Established under the laws of Bermuda to carry on general insurance business. A 100% owned subsidiary of Carnforth Limited.
	IMC Exploration Company acquired Wrightsmen properties February 20, 1976	IMC Exploration Company (IMC subsidiary) acquired oil, gas and mineral assets in Louisiana from Wrightsmen Investment Company for \$38.5 million. The acquisition added reserves estimated at 71 billion cubic feet of gas and 5 million barrels of oil and condensate.
	Rockwood foundry plant on stream May, 1976	A new plant came on stream at Rockwood, MI. Capital spending was \$1.8 million and included the acquisition of sand coating facilities and construction of new shell resin manufacturing equipment.
	IMC Chemical Group, Inc. formed May 1, 1976	Sobin Chemicals, Inc. (Mass.) merged into Commercial Solvents Corporation (Md.) and name changed to IMC Chemical Group, Inc. (IMC subsidiary).
	Dividend increased	Quarterly common stock dividend increased from 50¢ to 60¢ per share payable 6-30-76.
	Des Plaines, Ill. Office purchased May 25, 1976	Office building and 10.84 acres land purchased from Advance Schools, Inc. for \$1.2 million for use by IMC Industry and Chemical groups.

YEAR ENDED
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EVENT

COMMENTS

1976

Great Lakes Container Division sold
May 31, 1976

Great Lakes Container Division sold to The 3016 Corporation (Irving A. Rubin)
for \$7.5 million.

Employee Stock Ownership Plan adopted

IMC established an ESOP plan in fiscal 1976 under the provisions of the Tax
Reduction Act of 1975.

Grand Jury Indictment and subsequent private
Treble Damage Action

Indictment issued in June by Chicago Grand Jury charging several potash producers
(including IMC) with a misdemeanor under Sherman Antitrust Act. Companion civil
case also filed.

1977

McWhorter Chemicals assets transferred

Net assets of McWhorter Chemicals (\$3,415,000) transferred from the Chemical
Group to the Industry Group in July.

Transfer Agent/Registrar appointed
August 1, 1976

The First National Bank of Chicago and Bank of America appointed transfer
agents/registrar for IMC stock.

North Theall, La. gas field acquired
August 26, 1976

Acquisition of 100% working interest in North Theall Field for approximately
\$4.1 million.

Florida phosphate property options signed
October 25, 1976

Ten-year option on 21,000 acres of east central Florida (Broward County) property
signed.

Headquarters Office site purchased
December 10, 1976

Purchase of 9.5 acres of land in Northbrook, Ill. for approximately \$1 million.

Sale of SAMAF interest

IMC Canada sold its 49% interest in this joint venture with Paribas in
manganese and iron ore mining in Gabon and Mauretania.

Sodium Chlorate Plant construction announced
January 6, 1977

Announced construction of \$11 million sodium chlorate plant in Orrington, Maine.

Blue Mountain, Miss. minerals absorbent plant
acquired January 7, 1977

Acquired minerals absorbent business from BASF Wyandotte Corp. for \$2.0 million.

Ammonia Plant, Sterlington, La. constructed

Ammonia plant completed in February at a cost of \$72 million. Capacity 1,150
tons per day.

Laurel Ridge, La. gas field acquired
March 17, 1977

Purchased 48.6% interest in Louisiana gas field for approximately \$29 million.

Bridgeport, Ala. ferrosilicon plant completed

Construction completed in April and production started at 40 MW electric
ferrosilicon furnace, a joint venture of IMC (75%) and Allegheny Ludlum (25).
Annual capacity of 75,000 net tons of 50% ferrosilicon.

Montrose, N.J. Plant sold May, 1977

Montrose organic chemicals plant at Newark, N.J. sold at a loss of \$1,357,000.

Grand Jury acquittal May 6, 1977

IMC and other potash producers were found not guilty and were acquitted in
criminal antitrust proceedings brought in 1976 by the U.S. government. In
June, 1977 the court dismissed a related civil action.

Dividend increase May 18, 1977

Quarterly common stock dividend increased from 60¢ to 65¢ payable 6-30-77.

Series A preferred stock converted
June, 1977

All of the outstanding \$100 par value Series A preferred stock shares were
converted into 361,010 common shares.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1978

MV "Jotunfjell" acquired

Purchased 54,000 ton oceangoing bulk carrier for an investment of \$8 million. Renamed "Industry Trader."

Northeastern Laboratories, Inc. acquired
July 2, 1977

Acquired capital stock of Northeastern (latex paint emulsion producer) for \$600,000.

Johnson Coal properties acquired

Acquired two eastern Kentucky coal properties (Crescent Industries, Inc. and Southern Elkhorn Coal Corporation) from Donald D. Johnson family for approximately \$36 million cash and 54,082 shares of IMC common stock.

Private treble damage actions settled
August, 1977

A settlement agreement was entered into between the defendants in the private damage actions taken June, 1976 and plaintiffs representing a class of direct purchasers of potash. Also in August the U.S. District Court in Chicago dismissed suits brought on behalf of indirect purchasers.

Great Plains Production Company acquired
August 10, 1977

Acquisition of stock of Great Plains Production Company, Laurel Ridge, La. field authorized for approximately \$9.3 million.

Kimball Tennessee ferrosilicon plant modernized

Modernization completed in September for \$1.6 million, upgrading product and boosting capacity by 30%.

Animal feed ingredients plant sold
September 1, 1977

IMC's AFI plant in Polk County, Fla. sold to CF Chemicals, Inc. for \$7.5 million resulting in after-tax gain of about \$2 million.

Animal feed ingredients plant completed
September 15, 1977

\$35.6 Million animal feed ingredients plant at New Wales, Fla. replaced plant sold to CF Chemicals this month. Capacity equivalent to 215,000 P₂O₅ tons per year.

Certificate of Incorporation amended
October 5, 1977

IMC shareholders approved amendments to the Certificate of Incorporation to eliminate the 192,743 authorized shares formerly designated as Series Preferred Stock, \$100 par, and to redesignate the Second Series Preferred Stock, \$1 par, as Series Preferred Stock.

R. A. Lenon elected Chairman October 5, 1977

R. A. Lenon elected to the additional office of Chairman of the Board of Directors

Explosives consolidation program completed
October 31, 1977

Production expanded at Wolf Lake, Ill. and Springville, Utah plants and the Seiple, Pa. and Tacoma, Wa. plants closed.

Coastal Petroleum Corporation lawsuit

Lawsuit brought against IMC and other central Florida phosphate producers in November alleging phosphate mined from lands held by Coastal under lease from State of Florida.

Great Plains Production Company liquidated
November 30, 1977

IMC's wholly-owned subsidiary, Great Plains Production Company liquidated.

Thermatomic Carbon facility closed
December 1, 1977

Sterlington, La. thermatomic carbon facility closed.

A. E. Cascino elected Vice Chairman

A. E. Cascino elected Vice Chairman of IMC Board effective 1-1-78 while continuing as Executive Vice President.

Potash Corporation of Saskatchewan purchase
of AMAX Potash Limited (AMAX) reserves
January 31, 1978

PCS purchased AMAX mineral reserves and rights in a long-term contract executed 1971 under which IMC mined and refined reserves for AMAX for a fee plus a pro rata share of production costs.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1978

Chemical Leaman Corporation stock sale
February 23, 1978

337,133 Shares of Chemical Leaman Corporation common stock purchased July 7, 19 held by IMC sold to Oakbrook Consolidated, Inc. at \$27 per share for a \$1.7 mil pre-tax gain.

Announced purchase of IMC stock
March 23, 1978

IMC announced intentions to purchase up to 500,000 shares of its own common stock for stock options and other employee benefit plans.

Purchase of Des Plaines, IL. property April, 1978

Purchased property designated as IMC Garage for \$700,000.

Oil and gas interests sold,
St. Martinsville, Louisiana,
April 19, 1978

Sale of oil and gas interests in St. Martinsville Field to Santa Fe Minerals, Inc. for a net gain of \$7.6 million. Sold reserves of 83,300 barrels of oil and 12.8 BCF of gas.

President elected May 1, 1978

George D. Kennedy elected President. R. A. Lenon continuing as Chairman and CEO

Multifos Plant opened June, 1978

An \$18 million defluorinated phosphate animal feed plant opened adjacent to New Wales phosphate chemicals facilities.

Chemicals International assets sold
June 1, 1978

Certain assets of Chemicals International Division sold to Sobin Chemicals, Inc., a division of Associated Metals & Minerals Corp.

Uranium recovery plants construction
approved June 21, 1978

Approved construction of uranium extraction facilities at New Wales, Fla. for \$46.2 million. Design capacity, 741,000 lb of U₃O₈ annually.

IMC businesses reorganized

Board of Directors approved a reorganization of IMC into five business groups: Fertilizer, Animal Products, Energy, Industry and Chemicals. Energy Group formed by combining Coal, Gas and Oil and Uranium operations. Animal Products group formed by combining elements of Agriculture (feed ingredients) and Chemicals (biochemicals and veterinary products).

IMC Chemical Group, Inc. and IMC Industry Group,
Inc. merged into IMC, June 30, 1978

1979

Additional uranium recovery plant
construction announced August 31, 1978

\$67.3 Million to be invested to more than double uranium oxide production capacity with construction of two plants in Florida at CF Industries' locations. Design capacity, 1,263,000 pounds of U₃O₈ annually.

Potash milestone achieved November 6, 1978

Potash brought to surface at Esterhazy reaches 100 million tons. First chunks of ore were reached June 8, 1962 after five years of struggle to sink a shaft.

Sodium Chlorate plant began operation
November 30, 1978

40 million tons/year facility completed at cost of \$15 million.

A. E. Cascino retired December 31, 1978

A. E. Cascino, Executive Vice President, retired but continued as Vice Chairman of IMC Board.

Coastal Petroleum Corporation initiated second
lawsuit January, 1979

Coastal sued IMC and Mobil claiming violation of Sections 1 and 2 of the Sherman Act regarding Florida phosphate mining.

Headquarters Office moved January 2, 1979

IMC corporate headquarters moved to Northbrook, Ill. from IMC Plaza, Libertyville, Ill. Land and construction costs totalled \$7.1 million for the building at 2315 Sanders Road.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1979	Revolving credit agreement	IMC entered into an agreement with a group of U.S. banks whereby a maximum of \$150 million could be borrowed at the prime rate with provisions for renegotiation
	Dividend increased	Quarterly common stock dividend increased from 65¢ to 75¢ per share payable 3-31-79.
	New Brunswick potash and salt property rights sold March 19, 1979	IMC-Canada rights in New Brunswick, Canada, sold to Denison Mines Limited for a pre-tax gain of \$24 million.
	Laviosa production expanded	South African chrome ore mining production increased from 330,000 tons to 550,000 tons per year at an investment of \$2 million.
	New Wales wet rock grinding began	New Wales converted from use of dry rock to wet rock grinding process and operation initiated. When project finally closed out in March, 1980, total cost was \$12.0 million.
	IOTA Quartz facility constructed	Construction completed on a processing plant for production of high purity IOTA quartz at Spruce Pine, N.C. Total capital investment of \$1.5 million.
1980	Cargo vessel sold	Carbon Products business sold "Industry Trader" for an approximate pre-tax gain of \$2.7 million.
	IMC Pipeline Company, Inc. formed July 5, 1979	Incorporated in Louisiana as subsidiary of IMC Exploration Company.
	Beaver Explosives, Inc. interest acquired July 6, 1979	Acquired 50% of Beaver stock for \$532,000 with option to acquire other 50%.
	Plaquemine, Louisiana methanol plant acquired July 20, 1979	Allemania, IMC and Ashland Chemical Co., through Allemania Chemical Co., a 50/50 joint venture acquired Plaquemine, La. methanol plant from Hercules/American Petrofina Inc. IMC share of cost, \$6.7 million. Capacity is 80 million gallons of methanol annually.
	OK Syndicate sold August, 1979	Sold interest in British Columbia copper mining venture for \$1.6 million net gain
	New Wales phosphate chemicals expansion (Third Train) approved August 15, 1979	Approval of engineering work for 500,000 P ₂ O ₅ ton third train expansion at New Wales. Total project fixed capital and interest during construction to be \$220 million.
	Stock Option and Award Plan amended October, 1979	The 1973 plan was amended to provide for the award of restricted shares of IMC's common stock.
	Uranium Technology joint venture formed	IMC/Metallurgie-Hoboken-Overpelt/Societe de Prayon form joint venture to collectively license worldwide new uranium recovery technology.
	Carver Foundry Products, Inc. acquired November 2, 1979	Carver Foundry Products, Inc., Muscatine, Iowa, acquired for \$1 million plus assumption of debts.
	Rail car repair facility construction approved December 19, 1979	\$3.8 Million rail car repair facility construction at Fitzgerald, Ga. authorized. Completed 11-81.
	Retirement benefits increased	Pension benefits increased and one-time cash payment authorized for persons retired prior to 1-1-79.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1980	New Wales expansion completed January, 1980	New Wales capacity expanded from 900,000 tons P ₂ O ₅ to 975,000 tons at a cost of \$8.2 million.
	Prudential loan refinanced February 1, 1980	Prudential Insurance Company of America - \$185 million, 8-3/4% promissory notes due 1-1-2000. Replaced \$125 million, 7.45% promissory notes due in 1994.
	Dividend increased	Quarterly common stock dividend increased from 75¢ to 87¢ per share payable 3-31-80.
	Four Corners Mine joint venture approved March 19, 1980	IMC Board approved IMC/W. R. Grace & Co. 50/50 joint venture for production of phosphate rock in Manatee and Hillsborough Counties in central Florida, a \$400 million project. The mine would yield an estimated 3 to 4 million short tons of phosphate rock per year at full capacity.
	Harvey, La. Terminal sold March 27, 1980	Harvey terminal sold to Delta Commodities, Inc. for \$4,350,000.
	Exploration agreement signed with Province of Manitoba April, 1980	Letter of Intent signed with Province of Manitoba granting IMC-Canada potash exploration rights in western Manitoba.
	Stock split April 25, 1980	50% Common stock distribution (1 for 2) on 4-25-80 to holders of record 4-2-80. Dividend on new shares 58¢ per share quarterly.
	Uranium recovery plant, New Wales started operation May, 1980	
	11.875% Sinking Fund Debentures sold in May, 1980, Due May 1, 2005	IMC sold through underwriters \$100 million par value sinking fund debentures. Price to public 99% - proceeds to IMC \$98,125,000. Underwriters' discount \$875,000. Sinking fund payments begin 5-1-86.
	Uranium recovery plants overrun approved May 21, 1980	Additional capital of \$71.5 million approved, \$23.7 million for New Wales and \$47.8 million for CF units.
	Capitalization of interest adopted	IMC adopted retroactive to July, 1979 the policy of capitalization of interest costs during the construction of certain plants and equipment.
	IMCORE Division formed	Division formed through reorganization and combination of elements from Chemical Group's Industrial Minerals Division and Industry Group's Foundry Products Division.
1981	Energy Group dissolved July 1, 1980	Energy Group had been composed of Coal, Uranium and Gas and Oil. The Coal business and Gas and Oil were designated separate segments and Uranium included with Fertilizer.
	NYMA B.V., Holland sale authorized September 17, 1980	Authorization to sell capital stock of NYMA for \$1,295,000. Sale closed 11/24/86
	Christina property, Polk County, Florida sold September 30, 1980	Sale of residential properties of Christina to L. K. Hoffman for \$2,750,000.
	Uranium recovery plants, CF Industries started operation November, 1980	
	Continental Ore Europe, Ltd. sold December 17, 1980	Sold to Credit Suisse First Boston U. K. Limited.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1981	Teel Oil & Gas Properties in Louisiana acquired December 17, 1980	Acquired properties in Monroe, La. for \$10.3 million.
	Hunt Bros. Ranch, Inc. acquired January 12, 1981	Acquired 4,496 acres phosphate reserve land in Hillsborough County, Florida for \$13,797,000.
	Aristo Corporation sold January 20, 1981	Aristo Corporation (resins) a wholly-owned IMC subsidiary sold to Delta Resins and Refractories, Inc.
	Tampa Port Authority agreement signed February, 1981	IMC entered into an agreement with the TPA for construction and leaseback to IMC of a 50,000 ton anhydrous ammonia storage facility at Port Sutton. The construction cost was financed through the issuance by the TPA of \$12 million special purpose revenue bonds.
	Port Maitland MAP expansion completed February, 1981	A \$1.6 million expansion at this concentrated phosphate chemicals operation was completed. The project was designed to save energy in the production of 50,000 tons of monanamonium phosphate each year.
	Dividend increased	Quarterly common stock dividend increased from 58¢ to 65¢ per share payable 3-31-81.
	McWhorter Division sold February 27, 1981	McWhorter Division (resin) sold to Valspar Corporation for approximately \$6.7 million. Resin and emulsion production facilities in Carpentersville, Ill. and Melville, Long Island, were sold.
	Perry Point, La. propane extraction plant sold April, 1981	Sold propane plant for \$550,000 to Tipperary Corporation.
	Manitoba potash development agreement signed	IMC signed memorandum of agreement with Province of Manitoba contemplating a partnership to develop potash deposits in western Manitoba.
	LIFO adopted	The LIFO method for determining the cost of domestic product inventories was adopted retroactive to July 1, 1980.
	New Data Center at Mundelein Office completed June, 1981	A new data processing center completed for \$2.6 million became operational at the General Office at Mundelein.
	ARCO Land Exchange agreement signed June 19, 1981	Acquisition of 5,910 acres phosphate reserve land in Hillsborough County, Fla. from Atlantic Richfield Company in exchange for property acceptable to ARCO owned or to be acquired by IMC, or \$36 million cash. Acquisition completed February, 1984.
	New Wales Chemicals, Inc. merged into IMC June 30, 1981	
	Seiple modernization completed	Construction of a new formaldehyde plant and installation of energy and labor saving devices to reduce manufacturing costs of pentaerythritol. Fixed capital invested \$8,139,000.
	IMC/PCS agreement reached	A service agreement with Potash Corporation of Saskatchewan was renewed through 6-30-86, renewable at the option of PCS for eight additional five-year periods. An annual maximum of about one-fourth of the tons produced at Esterhazy may be produced for PCS.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1982	Beaver Explosives, Inc. interest acquired	Acquisition of remaining 50% of Beaver stock for \$465,000.
	Societe Anonyme de Minerais, Luxembourg, sold July 3, 1981	S. A. de Minerais, a former COC subsidiary, sold to Karl O. Helm A. G.
	Coal business sold September 25, 1981	Completion of sale of Kentucky coal assets to United Coal Company for \$21,350,000.
	New dragline began operation October, 1981	IMC's newest and the largest in the Florida phosphate industry began operation. The 4000 ton dragline cost \$17.9 million, took one year to build and was named Ace of Spades.
	Rail car repair facility opened October, 1981	The Fitzgerald, Ga. rail car repair facility was completed at a cost of \$4.2 million.
	Cancarb Ltd. sold October 9, 1981	Wholly-owned IMC subsidiary - Cancarb Ltd. (Canada) sold to TCPL Resources Ltd., subsidiary of TransCanada Pipelines Ltd. Producer of carbon black at plant in a Medicine Hat, Alberta.
	Purchase of interest in PARGESA Holding, S.A. October 7, 1981	Purchased investment in capital stock of PARGESA for \$2,649,500.
	Agreement to purchase IMC common stock from Leirs announced November 11, 1981	Announced agreement with Henry J. and Erna Leir for IMC's purchase of 1,563,000 shares of IMC common stock for \$41.50 per share, payable 5-7-82 without interest. IMC later agreed on 1-7-82 to pay a discounted sum of \$61,629,090.
	Sale of tax benefits completed	The quarter ended 12-31-82 included a \$19.3 million gain, net of related income taxes of \$26.0 million from the sale of certain tax benefits under a tax benefit transfer lease.
	1981 Incentive Stock Option Plan authorized	
	Debt-Equity swap completed	Exchanged with Lazard Freres & Co. 818,929 shares IMC common stock for \$34,845,000 IMC 9.35% Sinking Fund Debentures. The exchange resulted in a nontaxable gain of \$9.2 million.
	Ammonia supply system completed December, 1981	Construction completed on ammonia injection pipeline (32 miles) with a capacity of 400,000 tons per year from Sterlington to the Santa Fe main pipeline system to pay back trades with co-producers on deep water in the lower Mississippi area. Total spending \$4,205,000.
	Ammonia storage and shipping facilities completed January, 1982	Construction completed at Port Sutton allowing ammonia to be received by ocean-going vessel and moved by pipeline to New Wales. Facility cost \$7.5 million financed under a long-term lease arrangement.
	Nepheline Syenite plant expanded	Modernization and expansion of Blue Mountain, Ontario nepheline syenite processing facilities completed for \$5.1 million.
	Quarry and specialty explosives business sold January 26, 1982	Quarry explosives business sold to Energy Science and Consultants, Inc., and specialty explosives products sold to Trojan Corporation (group of former IMC employees) for \$3 million plus book value of inventories.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1982	Electrochemicals business sold May 3, 1982	IMC sold its electrochemicals plants and businesses to LCP Chemicals & Plastics, Inc. for approximately \$30 million. Included caustic potash plant in Ashtabula, Ohio, chlorine-caustic soda plant in Orrington, Maine, chloropicrin plants at both locations and the muriatic acid plant at Orrington, plus IMC's share of caustic potash from its continuing joint venture with Hooker Chemical in Niagara Falls, New York.
	Property donated to Town of Esterhazy June, 1982	Approximately 87 acres of property were donated by IMC (Canada) Ltd. to the Town of Esterhazy Recreation Community Association. The fair market value of the property was \$2 million.
	Negotiations with the Province of Manitoba put on hold	Negotiations for a new potash mine are not expected to resume until the markets for potash improve.
	Third train completed	Construction of 500,000 ton phosphate chemicals plant at New Wales was completed for \$176.5 million. Increased IMC's existing Florida capacity by about 50%. Because of declining prices and reduced farm acres planted, the unit did not start operation until July, 1984.
1983	Nitroparaffins business sold July 12, 1982	NP Division sold to Angus Chemical Company, a subsidiary of Alberta Natural Gas Company, Ltd., Calgary and Pacific Gas Transmission Company, San Francisco. Sale includes IMC's production of basic nitroparaffins and NP derivatives at Sterlington, La., Terre Haute, Ind. and Ibbenburen, West Germany.
	Phosphate rock exchange agreement signed August 9, 1982	Agreement signed with Mississippi Chemical Corporation to supply them with phosphate rock over 22 years with payment in cash and the exchange of 14,000 acres of Florida phosphate rock reserves.
	Ammonia Pipeline construction completed September, 1982	Construction completed and product shipped through pipeline from Port Sutton storage terminal to Gardinier plant at Tampa. Total cost of pipeline \$1.4 million to be paid over a 10 year period to Tampa Pipeline Transportation Company. This obligation is backed by take-or-pay commitments from Gardinier for a 10 year period.
	First Mississippi, Inc. retail operations acquired September 1, 1982	Acquired 55 fertilizer retail sales outlets, principally in Iowa and Illinois, from First Miss, Inc. for \$27.8 million.
	T. H. Benners & Company, Inc. acquired September 15, 1982	Acquisition by IMC of all outstanding shares of Benners, a ferroalloys business for approximately \$300,000.
	Sulphate of Potash Magnesia Export Assoc. formed September 23, 1982	IMC and Duval Corporation formed Sulphate of Potash Magnesia Export Assoc. to promote overseas marketing of this product.
	Western operations sold January 4, 1983	IMC and Arizona Feeds announced sale of IMC's premix animal feed business in the southwestern U.S for \$3.6 million, a \$.5 million pre-tax gain. Included were the Phoenix offices plus production facilities at Cashion, Ariz. and Imperial, Calif.
	Shell Oil properties acquired	Working interest in 14 producing gas wells and related assets in Terrebonne Parish, La. acquired for \$12.9 million. Estimated total reserves net to IMC are 625,000 barrels of oil, 12.4 BCF of gas and 115,000 barrels of gas liquids.
	Purchase of Sotave Equity Interest April 18, 1983	A 25% equity interest was acquired in Sotave Amazonia Quimica & Mineral S.A., a Brazilian fertilizer production project for \$13 million. IMC will supply raw materials to Sotave and will have exclusive marketing rights for product exported.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1983	Animal Science Research facility approved	Construction of a new facility began on an 80 acre site in Terre Haute. Total spending of \$3.1 million will include animal test buildings, feed mixing area and office complex.
	Petroleum coke bulk handling facility approved	Project authorized for \$15.8 million at Texas City, Texas. A change in scope for the project was approved in February, 1984 revising cost to \$12.5 million.
	"Energy Ammonia" began transporting ammonia	A new 8000-ton ocean-going barge and a tug boat built especially for IMC under a time charter arrangement has begun transporting ammonia to new storage facilities at Port Sutton, Fla. Cost of units is \$27 million.
	Energy retrofit - megawatt turbogenerator authorized June 15, 1983	Authorized construction at New Wales, Fla. of heat recovery equipment in four of the sulphuric acid plants to convert heat to electrical power through a new steam driven 58 megawatt turbogenerator for \$28 million.
	IMC/Ashland Oil Joint Venture retrofit completed June 30, 1983	Allemania Chemical Co. joint venture retrofit completed at methanol plant at Plaquemine, La. Total spending on project \$47.2 million.
1984	Phosphate reserves sold to ZEN-NOH July 1, 1983	Sale of 4.5 million tons of IMC phosphate rock reserves in Clear Springs, Fla. for \$13.2 million. IMC will mine and process the ZEN-NOH rock reserves over a minimum of 13 years.
	Des Plaines Garage leased July 1, 1983	Five-year lease signed by Riverside Chevrolet for the property located at 1723 Busse Highway, Des Plaines, Ill.
	Des Plaines Office sold July 11, 1983	Former headquarters of Chemical and Industry Groups sold for \$4.0 million.
	Chinhae Interest increased July 22, 1983	IMC increased ownership in Chinhae Chemical Company, Ltd. from 25 to 50% with the purchase of Gulf Oil (Great Britain) Ltd's share of the fertilizer producer in South Korea.
	Top management changes October 19, 1983	G. D. Kennedy, President of IMC, was elected to the additional post of Chief Executive Officer. R. A. Lenon remains Chairman of the Board. A. E. Cascino retired as Vice-Chairman of the Board.
	Construction began on Texas City, Texas dry bulk marine terminal	This terminal on a 93 acre site is designed to handle petroleum coke potash, soda ash and other dry bulk products for loading into ocean going vessels.
	Phosphate reserves acquired March 15, 1984	Acquired Wright property adjacent to the Morayn Mine consisting of approximately 1,340 acres of phosphate reserves for \$25 million from Estech, Inc.
	Fifth shaft at Carlsbad completed	Shaft completed for \$10 million providing access to additional potash reserves.
	Purchase of Corporate Research Center March 15, 1984	Acquired land and buildings in Northbrook, Ill. for development into Corporate Research Center for \$1.1 million. Renovation for \$2.1 million is to be completed by June, 1987.
	Sterwin Laboratories, Inc. acquired April 2, 1984	Purchased stock of this Millsboro, Del. firm, from Sterling Drug, Inc. a leader in the poultry biological market for \$3.1 million - \$1.4 million for stock plus \$1.7 million for working capital. Sterwin became a wholly-owned subsidiary.
	75th Anniversary of incorporation	Incorporated under the laws of the State of New York as International Agricultural Corporation on June 14, 1909.

YEAR ENDED
JUNE 30

EVENT

COMMENTS

1984

Port Maitland production operation discontinued

Production of phosphate chemicals and animal feed ingredients at the Ontario, Canada plant were discontinued in June. A reserve of \$8.9 million was charged against operations. Distribution operations for fertilizer products and feed ingredients will continue from Port Maitland.

Methanol plant write off

IMC made a year-end provision of \$27.6 million for the estimated loss on disposal of its interest in the Louisiana methanol venture. Plant subsequently shut down in late July and Ashland announced a loss provision in their September 30, 1984 quarter.

Pargesa Holding, S.A. investment sold

Sold investment in capital stock of Pargesa for \$3.4 million.

Animal Science Research facility opened

This new \$3.1 million annual science center was essentially completed to expand research in animal products.

1985

IMCORE Division reorganized

The IMCORE Division was reorganized into the Industrial Minerals Division and Quartz Products. The Industrial Minerals Division included all former IMCORE operations except Quartz Products.

Reversal of DISC deferred taxes

The 1984 Tax Reform Act replaced domestic international sales corporations with foreign sales corporations. The Act also forgave taxes on deferred income of the DISC. As a result, \$7.5 million of previously provided deferred income taxes were no longer needed and reversed to income.

Debt-equity exchange

In July \$27.6 million 11.875% debentures and \$12.3 million 9.35% debentures were reacquired in exchange for issuance of 539,582 shares of IMC common stock, and a principal cash payment of \$15.8 million. Nontaxable gain of \$6.3 million.

New Wales phosphate chemicals facilities (third train) began operation

The third phosphoric acid unit at New Wales, Florida came on stream July 9, 1984. This \$176.5 million, 500,000 ton-a-year unit had been mothballed since November, 1981 because of depressed prices for phosphate products.

Property donated to Polk County, Fla.

A 463 acre tract along Peace River near Homeland was donated to Polk County for recreational use.

Texas City, Tx. dry bulk marine terminal began operations October 1, 1984

This operation will handle petroleum coke, soda ash and other dry bulk products for loading into barges on ocean-going vessels. The facility will handle 500,000 tons of potash from Carlsbad and 600,000 tons of petroleum coke annually. Total cost approximately \$13.7 million.

IMC (Canada) Ltd. dividend

IMC (Canada) Ltd. paid a dividend to the parent company of \$130,000,000 (cdn). After a withholding tax of 10%, payable to the Canadian government, the cash received was \$117,000,000 (cdn) or \$88,448,745 (U.S.)

Purchase of Federal Paper Board stock

Purchased 558,100 shares of Federal Paper Board common stock at \$24 per share plus expenses for a total cost of \$13,536,596.

Purchase of IMC common stock

A total of 326,700 shares of IMC common stock were purchased for the treasury in December.

HISTORICAL FINANCIAL DATA
(000 Omitted)

Fiscal Year Ended June 30	Net Sales	Ordinary Earnings	1 Ordinary Earnings of Net Sales	Shareholders' Equity	2) Common Shares Outstanding *	2) Earnings Per Share	Book 2) Value Per Common Share	Long Term Debt	Working Capital	Property, Plant And Equipment		10) Return On Shareholders' Equity	11) Return on Invested Capital	Dividends Paid	
										Gross	Net			Per Share Common ²⁾ Stock	Per Share Preferred Stock
1909	\$			3,452					113	3,262	3,262				
1910	8,506	1,017	11.9%	16,949	78,359	9.78	87.10		1,034	3,401	3,401	6.0%	6.0%		4.32
1911	12,263	1,420	11.5	21,425	78,271	7.46	114.54		(1,395)	5,072	5,072	6.6	6.6		6.71
1912	18,656	1,465	7.8	26,985	73,035	7.04	190.67	13,000	6,771	5,691	5,472	5.4	3.7		7.00
1913	9,637	(161)	(1.6)	19,001	73,035	(14.72)	81.41	13,000	5,316	5,626	5,626	(.8)	(.5)		3.50
1914	11,260	306	2.7	19,206	73,035	(8.31)	84.21	12,418	4,491	5,898	5,735	1.6	1.0		
1915	7,804	176	2.2	19,383	73,035	(10.09)	86.64	11,772	4,040	6,194	6,098	.9	.5		
1916	8,719	1,034	11.8	20,417	73,035	1.65	100.79	11,188	4,766	6,345	5,932	5.0	3.2		
1917	9,581	578	6.0	20,995	73,035	(4.59)	108.71	10,743	5,717	6,880	6,377	2.7	1.8		
1918	14,912	1,168	7.8	22,121	72,606	3.50	124.86	10,285	7,886	22,084	21,101	5.2	3.6		
1919	15,427	1,607	10.4	22,912	72,606	9.55	135.76	9,881	9,916	22,189	20,654	7.0	4.9		6.25
1920	20,286	2,129	10.5	24,389	72,606	16.74	156.10	9,476	10,759	23,006	21,027	8.7	6.25		5.00
1921	14,079	(2,232)	(15.8)	21,666	72,606	(43.34)	118.60	9,042	6,328	24,740	22,344	(10.3)	(7.2)		3.75
1922	9,461	(388)	(.4)	21,278	72,606	(17.93)	113.25	8,638	5,983	24,787	22,277	(1.8)	(1.4)		
1923	10,891	(1,368)	(12.5)	19,104	72,606	(31.44)	125.39	8,228	8,529	24,786	21,987	(7.5)	(5.1)		
1924 ¹⁾	11,245	(549)	(4.9)	18,555	450,000	(2.78)	19.01	8,228	6,945	24,471	21,852	(2.9)	(1.9)		
1925	13,368	1,172	9.5	19,727	450,000	1.05	21.61	8,228	8,586	24,883	21,571	5.9	4.0		
1926	13,478	1,406	10.4	20,783	450,000	1.57	23.96	8,228	9,519	25,259	21,587	6.7	4.8		3.50
1927	11,220	(352)	(3.1)	19,905	450,000	(2.34)	22.01	8,228	8,341	25,399	21,599	(1.7)	(1.2)		5.25
1928	15,013	1,446	9.6	21,263	450,000	1.66	25.02	8,228	9,801	25,604	21,567	6.6	4.9		1.75
1929	15,541	1,116	7.2%	21,679	450,000	.93	25.95	7,853	10,007	25,808	21,264	5.1	3.7		7.00
1930	18,134	1,526	8.4	22,681	450,000	1.84	28.18	7,444	10,538	26,096	21,103	6.7	5.0		5.25
1931	13,334	60	.04	22,216	450,000	(1.42)	27.14	7,112	9,152	26,942	21,414	.3	.2		5.25
1932	7,091	(847)	(11.9)	21,368	450,000	(3.44)	25.26	6,629	7,194	27,411	20,961	(4.0)	(3.0)		
1933	6,947	(1,060)	(15.2)	20,308	450,000	(3.91)	22.90	6,267	6,255	27,425	20,566	(5.2)	(4.0)		

Fiscal Year Ended June 30	Net Sales	Ordinary Earnings	1 Ordinary Earnings of Net Sales	Shareholders' Equity	2) Common Shares Outstanding *	Earnings Per Share	2) Book Value Per Common Share	Long Term Debt	Working Capital	Property, Plant And Equipment		10) Return On Shareholders' Equity	11) Return on Invested Capital	Dividends Paid	
										Gross	Net			Per Share Common ²⁾ Stock	Per Share Preferred Stock
1934	\$ 9,080	400	.4	20,672	450,000	(.67)	23.71	6,082	6,551	27,578	20,420	1.9%	1.5%		
1935	9,723	269	2.8	20,418	436,048	(.99)	23.89	5,925	6,305	27,768	20,248	1.3	1.0		
1936	10,309	23	.2	20,471	436,048	(1.55)	24.01	5,777	6,438	27,836	19,881	.1	.1		
1937	12,649	770	6.1	20,942	436,048	.16	25.09	5,633	6,694	27,796	19,511	3.6	2.9		3.00
1938	12,198	701	5.7	21,443	436,048		26.24	3,892	6,579	27,991	19,280	3.3	2.8		2.00
1939	11,712	126	1.1	21,569	436,048	(1.32)	26.53	3,292	6,171	28,177	19,029	.6	.5		
1940	12,328	14	.1	21,583	436,044	(1.57)	26.56	4,500	5,725	26,709	18,476	.1	-		
1941	13,631	479	3.5	21,986	436,044	1.10	27.48	4,500	6,601	26,752	18,047	1.8	1.5		
1942	18,122	1,660	9.3	23,071	934,556	1.67	28.24	6,848	7,188	31,693	22,103	7.2	5.5		1.00
1943	22,477	2,081	9.3	24,251	2,804,244	.60	5.13	7,003	6,600	33,933	23,491	8.5	6.6	.17	4.00
1944	27,348	2,016	7.4	25,976	3,129,738	.52	5.15	6,360	8,633	33,930	22,631	7.7	6.2	.17	4.00
1945	30,301	2,038	6.7	27,576	3,566,796	.46	4.97	8,000	11,906	35,067	22,736	7.4	5.7	.17	4.00
1946	34,373	2,925	8.5	30,141	3,878,076	.65	5.23	8,782	11,337	39,691	26,350	9.7	7.5	.17	4.00
1947	41,302	3,826	9.3	36,604	4,728,930	.73	5.65	7,875	11,344	46,811	32,194	10.4	8.6	.22	4.00
1948	50,123	5,016	10.0	40,021	4,738,680	.98	6.37	13,125	13,244	54,796	39,039	12.5	9.4	.27	4.00
1949	53,394	5,421	10.1%	43,565	4,741,830	1.06	7.11	13,000	15,433	56,750	39,985	12.4	9.6	.32	4.00
1950	58,402	5,776	9.9	47,233	4,751,220	1.13	7.87	12,875	19,676	58,140	39,305	12.2	9.6	.37	4.00
1951	66,257	6,514	9.8	60,342	6,000,000	1.02	8.42	12,750	30,618	61,991	41,537	10.8	8.9	.53	4.00
1952	84,570	6,653	7.9	69,055	6,484,533	.97	9.13	11,975	27,879	76,388	51,737	9.6	8.2	.53	4.00
1953	88,837	7,030	7.9	77,471	6,948,492	.96	9.73	31,200	35,438	100,168	70,413	9.0	6.4	.53	4.00
1954	93,591	6,043	6.5	79,433	6,950,541	.81	10.01	30,425	31,191	109,994	76,034	7.6	5.4	.53	4.00
1955	96,485	6,321	6.6	81,955	6,982,911	.85	10.33	29,650	33,196	115,576	76,202	7.7	5.5	.53	4.00
1956	96,626	5,401	5.6	83,510	7,011,771	.71	10.51	28,875	33,360	122,131	77,308	6.4	4.7	.53	4.00
1957	106,188	6,960	6.6	87,053	7,011,861	.94	11.01	27,100	35,865	127,130	77,538	8.0	5.9	.53	4.00
1958	103,662	5,273	5.1	88,194	7,011,951	.70	11.18	25,561	33,132	134,126	80,136	6.0	4.4	.53	4.00

Fiscal Year Ended June 30	Net Sales	Ordinary Earnings	1 Ordinary Earnings of Net Sales	Shareholders' Equity	2) Common Shares Outstanding ⁺	2) Earnings Per Share	2) Book Value Per Common Share	Long Term Debt	Working Capital	Property, Plant And Equipment		10) Return On Shareholders' Equity	11) Return on Invested Capital	Dividends Paid	
										Gross	Net			Per Share Common ²⁾ Stock	Per Share Preferre Stock
1959	\$ 112,560	6,189	5.5	90,592	7,048,281	.83	11.46	26,737	29,904	145,764	86,653	6.8%	5.0%	.53	4.00
1960 ³⁾	125,645	7,644	6.1	94,921	7,095,492	.99	11.60	29,565	30,660	157,967	92,786	8.0	5.9	.53	4.00
1961 ⁴⁾	133,786	8,217	6.1	105,953	7,869,846	1.03	12.21	31,789	40,984	160,760	93,760	7.7	5.8	.53	4.00
1962 ⁵⁾	164,528	8,932	5.4	116,317	8,367,567	1.02	12.73	55,652	50,925	186,693	115,018	7.7	5.1	.53	4.00
1963	184,180	10,295	5.6	119,515	8,423,019	1.18	13.02	64,557	52,669	195,469	124,303	8.6	5.6	.53	4.00
1964	225,714	15,777	7.0	144,747	9,310,254	1.65	14.49	80,472	76,367	216,574	138,109	10.9	7.0	.67	4.00
1965	262,997	20,343	7.7	160,109	9,386,490	2.13	16.01	122,854	82,194	271,868	184,275	12.7	7.2	.67	4.00
1966 ⁶⁾	299,322	24,627	8.2	177,826	9,484,101	2.56	17.71	181,860	107,059	337,183	236,919	13.8	6.8	.80	4.00
1967 ⁷⁾	329,523	14,587	4.4	207,563	19,187,376	.71	8.96	196,139	89,156	395,305	283,510	7.6	8.0	.50	Various
1968 ⁸⁾	497,010	12,911	2.6	229,309	21,672,040	.50	7.83	274,050	175,127	437,861	296,132	5.9	5.5	.50	"
1969	504,161	2,941	.6	197,310	21,672,040	.04	6.36	223,815	143,019	389,611	248,977	1.4	3.9	.19	Various
1970	505,932	4,365	.9	199,558	21,822,682	.11	6.44	221,135	138,922	394,285	244,263	2.2	3.3	-	"
1971	517,556	12,796	2.5	213,328	22,123,668	.48	6.98	209,369	138,220	395,418	238,408	6.2	4.8	-	"
1972	491,169	20,226	4.1	228,925	22,239,880	.81	7.65	163,059	124,816	371,480	225,538	9.1	6.6	.12	"
1973	547,932	25,409	4.6	248,843	22,245,050	1.05	8.51	155,422	132,174	375,156	225,326	10.6	7.2	.19	"
1974	858,483	57,329	6.7	308,315	22,713,852	2.39	11.15	255,231	195,678	460,810	297,020	20.1	12.3	.38	"
1975 ⁹⁾	1,302,935	161,770	12.4	456,908	24,780,740	6.60	17.26	306,104	184,940	716,084	535,037	42.2	24.8	.92	"
1976	1,260,101	135,216	10.7	579,543	26,189,782	5.15	21.29	389,449	278,980	893,052	666,052	26.1	16.6	1.40	"
1977	1,280,245	108,238	8.5	649,285	26,916,324	4.06	23.76	387,006	254,880	1,071,621	778,579	17.6	12.1	1.63	"
1978	1,364,358	120,095	8.8	721,021	26,898,886	4.41	26.44	375,039	248,090	1,233,899	879,401	17.5	11.9	1.73	4.00
1979 ¹²⁾	1,474,678	120,808	8.2	790,194	26,832,957	4.48	29.08	339,414	229,334	1,389,263	939,664	16.0	11.5	1.87	4.00
1980	1,789,634	145,877	8.2	881,328	27,003,730	5.38	32.27	488,366	344,070	1,602,701	1,062,902	17.5	12.0	2.16	4.00
1981	1,984,930	153,787	7.7	975,262	27,178,880	5.63	35.52	486,315	260,185	1,896,355	1,246,821	16.6	11.2	2.46	4.00
1982	1,711,294	137,373	8.0	1,010,239	26,491,834	5.13	37.76	441,770	304,393	1,869,918	1,183,701	13.8	10.3	2.60	4.00
1983	1,461,996	80,512	5.5	1,024,100	26,606,237	3.02	38.12	424,608	277,936	1,983,698	1,182,838	7.9	6.5	2.60	4.00
1984	1,546,328	81,715	5.3	1,039,082	26,755,601	3.04	38.43	388,040	287,474	2,061,448	1,143,517	7.9	6.3	2.60	4.00

(Footnotes on following page)

ATTACHMENT

13

ANHYDROUS AMMONIA 5-18-93

(4-10-96)

(6-5-97)

A = NORTH SIDE
B = SOUTH SIDE



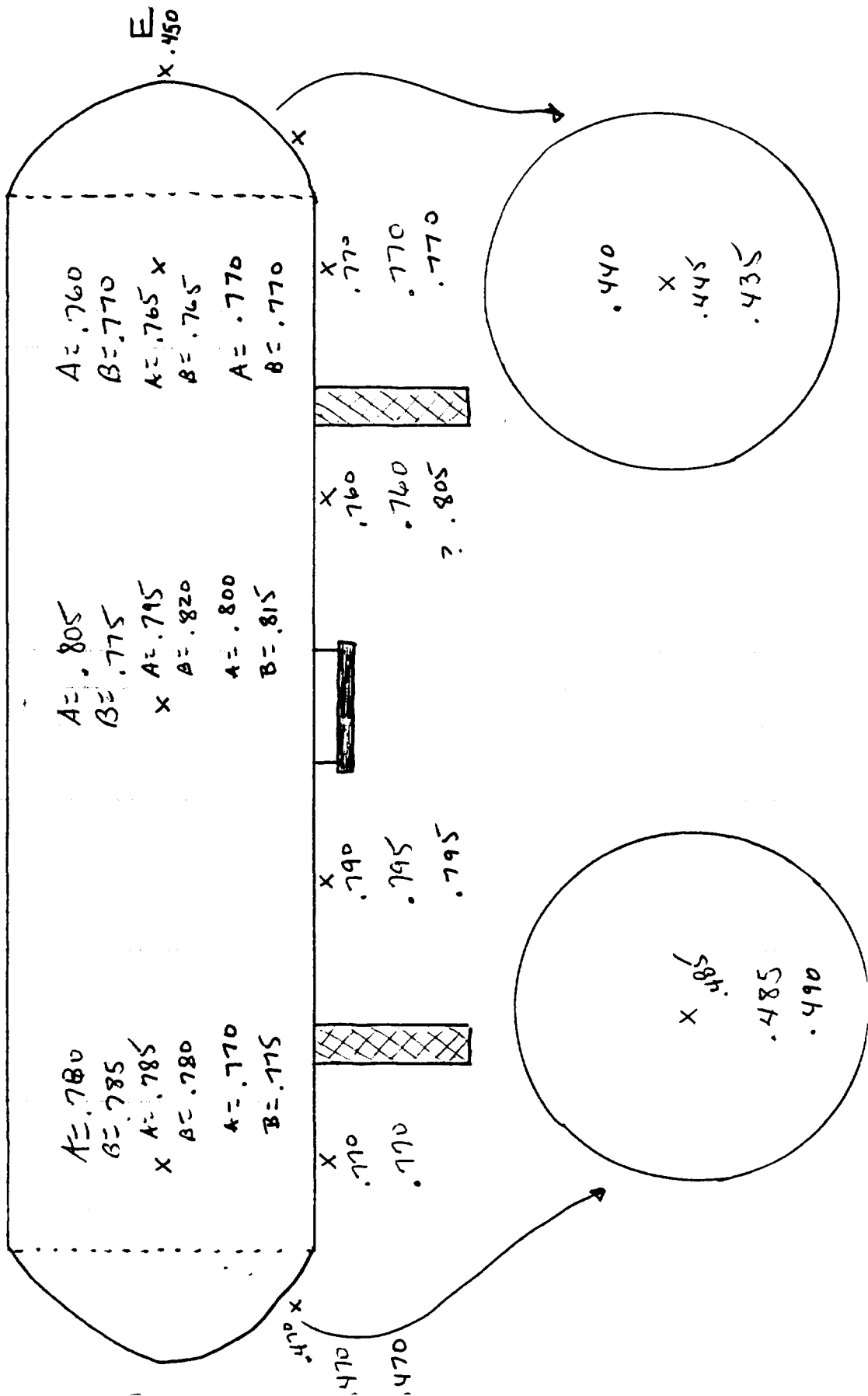
TennPlast Engineering, Inc.

Industrial Plastic Product

P.O. Box 40509

Memphis, Tennessee 38174-0509

(901) 942-4265

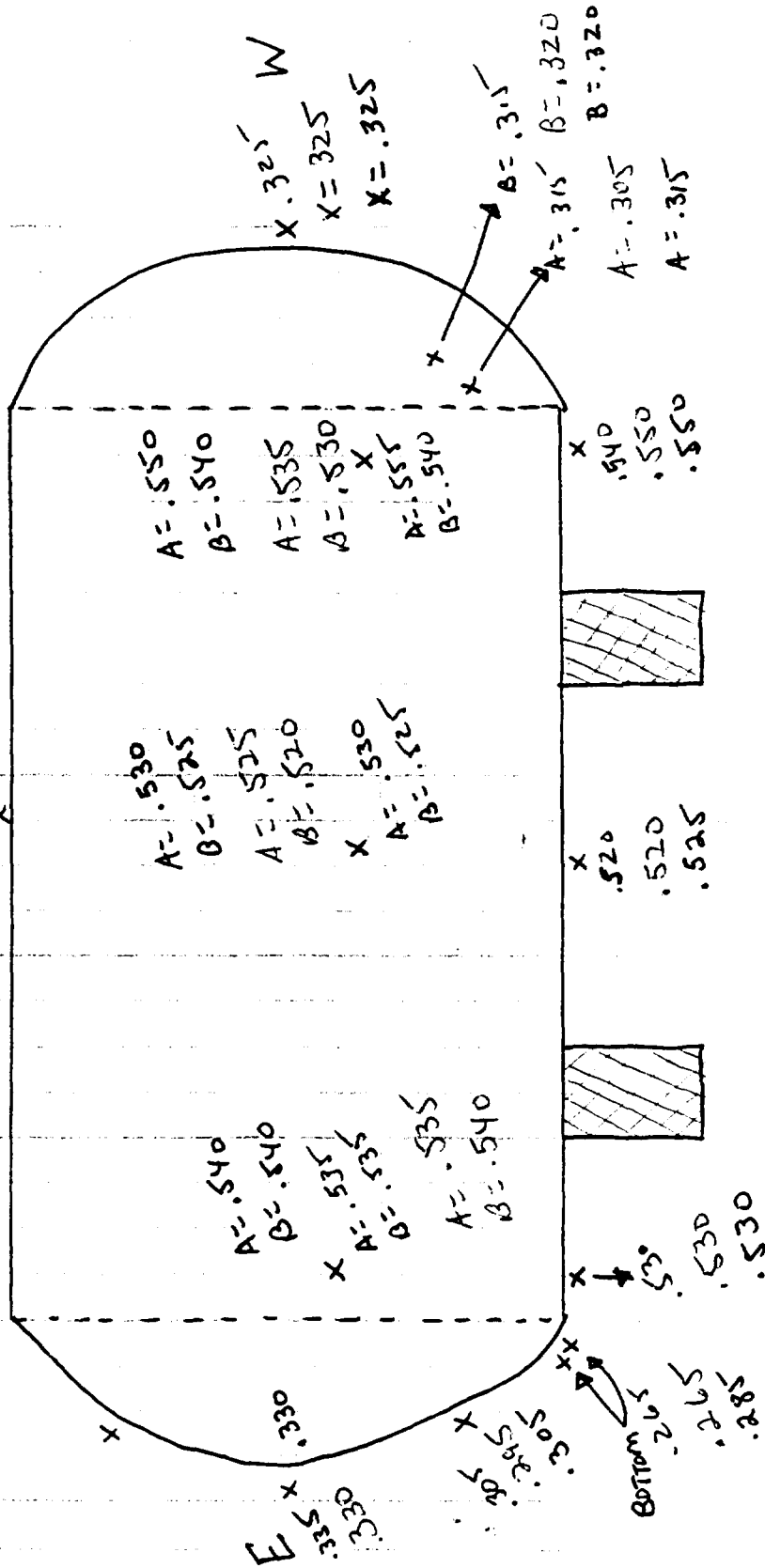


44.8 NITROGEN SOLUTION TANK

5-18-93

(6-5-97)

(4-25-96)



ALCOA

LOT 167-471

5086-D

Cust 343 FO-NO 18573

NO change from 5/92



TennPlast Engineering, Inc.

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#2 H₂SO₄ TANK (45,000 GAL)

5-18-93

(6-5-97)

(4-25-96)



TennPlast Engineering, Inc.

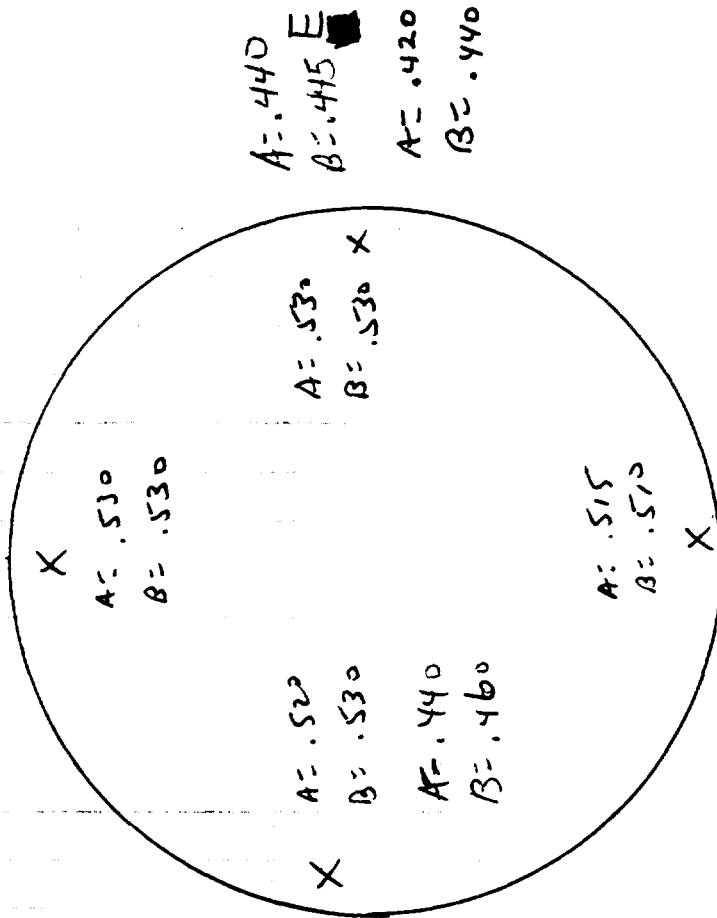
Industrial Plastic Product

P.O. Box 40509

Memphis, Tennessee 38174-0509

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N A = .450 A = .430
B = .460 B = .440



W A = .430
B = .440

S A = .435 A = .400
B = .445 B = .410

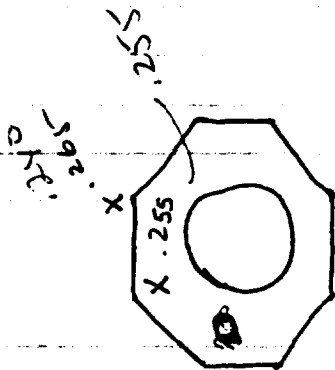
A = 6" off Bottom
B = 6 FT off Bottom

Slight detension from 5/92
AV → .015

#1 H₂SO₄ TANK (37,000 GAL)

5-18-93

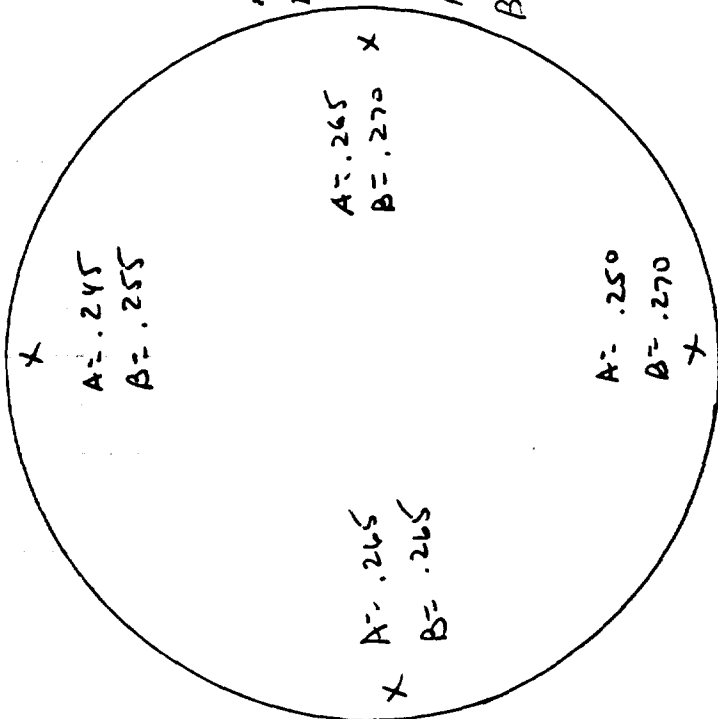
★ THIS TANK (FROM MEASUREMENTS 93-96) TAKEN OUT OF SERVICE 1997.



6-5-97
NEW TANK
2/97

(4-25-96)

A = .205
B = .220
N
A = .650
B = .645



A = .220
B = .230
E
A = .615
B = .610

A = 6" off Bottom
B = 6 ft off Bottom

★ For non-destructive
measuring - use
ultrasonic



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A = .620
B = .620
V
A = .225
B = .255

A = .620
B = .620

Ans → .015 in diam

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H₂PO₄ (RUBBER LINES)

5-18-93

THIS IS
EAST
TANK!
(4-25-96)

N

A = .380 A = .385
B = .380 B = .380

6-5-97

EAST TANK

E

A = .370
B = .375

A = .370

B = .3490 ?

W

A = .390 A = .385
B = .390 B = .390

A = .380
B = .390

A = .370
B = .375

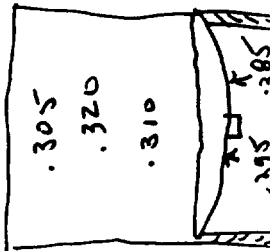
A = .370
B = .370

A = 6" off Bottom
B = 6" off Bottom

A = .375 A = .375
B = .370 B = .375

S

ENCLOSED SS TANK FROM STAUFFER



NO change from 5/92



TennPlast Engineering, Inc.

Industrial Plastic Product

P.O. Box 40509

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(901) 942-4265

5-18-93

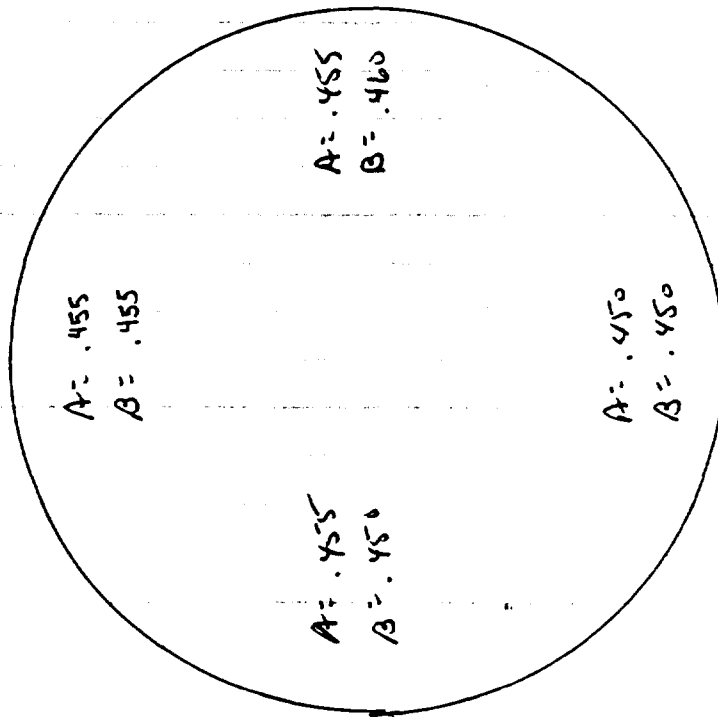
(4-25-96)

80,000 GAL

H₂SO₄ (93%)

6-5-97

N A = .430 A = .420
B = .440 B = .430



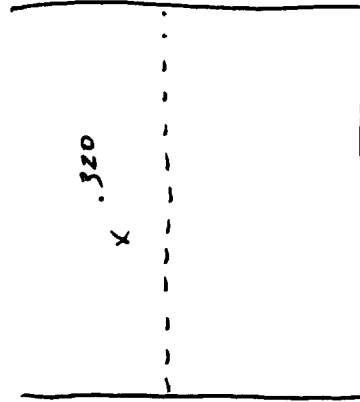
float pipe

E A = .435
B = .430
A = .410
B = .420

A = 6"
B = 6"

S A = .420 A = .410
B = .430 B = .430

W A = .420 A = .410
B = .450 B = .440



Aug. 015 form



TennPlast Engineering, Inc.

Industrial Plastic Product

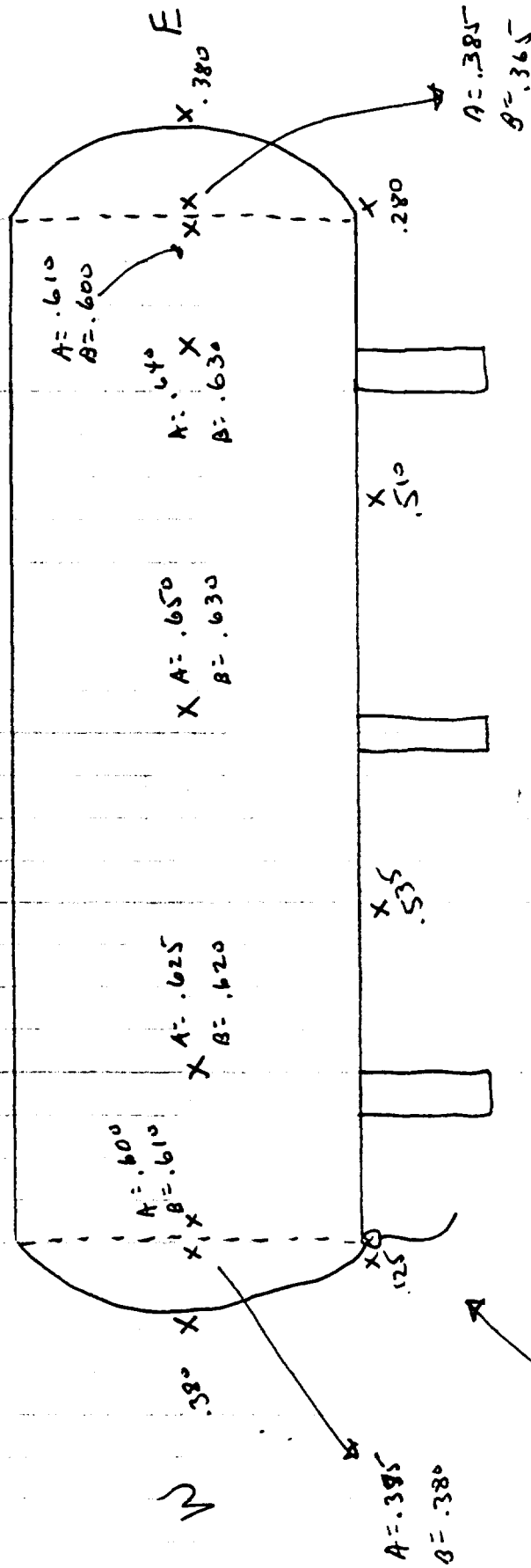
P.O. Box 40509

Memphis, Tennessee 38174-0509

(901) 942-4265

5-18-93

72% H_2SO_4 (SPENT ACID TANK)



A = SOUTH SIDE
B = NORTH SIDE

No change

check for
dimensional
accuracy
on
drawing
and
on
part

14FS

40,000 GAL (LINED)

5-18-93

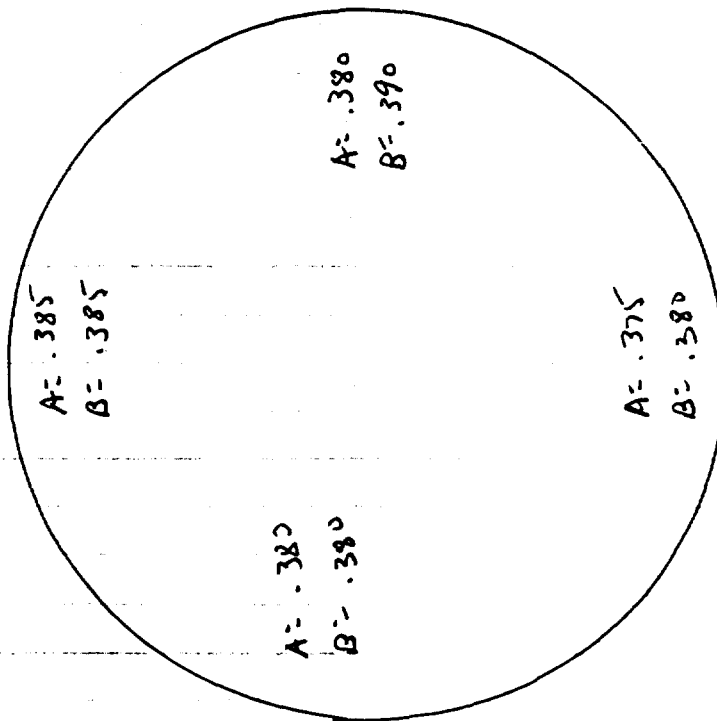
■ 6-5-97

(A-25-96)

N
A = .380 → .380
B = .380 → .380

W
.380 → A = .380
.385 → B = .385

A = 6 in
B = 6 ft



E
A = .385 → .380
B = .390 → .390

S
A = .375 → .380
B = .380 → .380

NO change from 5/92



TennPlast Engineering, Inc.

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\bar{F} $A = .190$
 $B = .195$

5-18-93

#2 FUEL OIL (15,000 GAL)
(4-25-96)

EMPTY
6-5-97

N $A = .195$
 $B = .195$

A circular diagram representing a tank. Inside the circle, there are four sets of handwritten measurements: $A = .195$, $B = .195$ (top left); $A = .195$, $B = .195$ (top right); $A = .195$, $B = .195$ (bottom right); and $A = .190$, $B = .195$ (bottom left). The letter 'W' is written below the bottom-left measurement.

S $A = .195$
 $B = .195$

NO change from 5/92

#2 FUEL OIL (10,000 GAL)
(4-25-96)

EMPTY - 6-5-97

N $A = .180$
 $B = .180$

A circular diagram representing a tank. Inside the circle, there are four sets of handwritten measurements: $A = .185$, $B = .180$ (top left); $A = .180$, $B = .180$ (top right); $A = .185$, $B = .180$ (bottom right); and $A = .180$, $B = .185$ (bottom left). The letter 'W' is written below the bottom-left measurement.

S $A = .185$
 $B = .180$

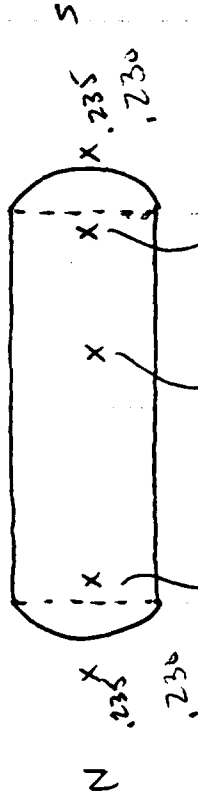
$A = 6''$
 $B = 6''$

NO change from 5/92

* in
partic
main
partic
partic
partic

PROPANE (1000 GAL)

A-26-46



A = .320
B = .320

A = .320
B = .320

A = .320
B = .315

.320
.320

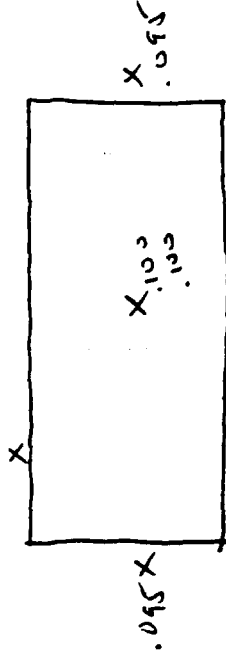
A = North West
B = South East

AV. → loss of .02

6-5-97

5-18-93

1000 GAL #2 DIESEL

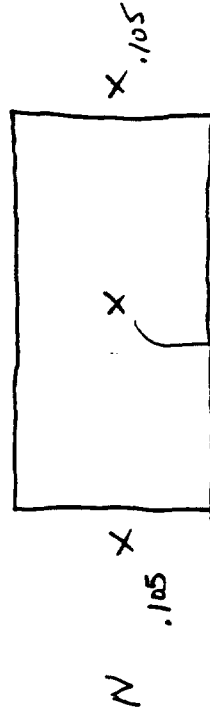


Empty 6/97

.145
- .095

.050

GASOLINE (550 GAL)



Empty
6/97

West A = .105
East B = .105

No change from 5/92



TennPlast Engineering, Inc.

Industrial Plastic Product

P.O. Box 40509

Memphis, Tennessee 38174-0509

(901) 942-4265

ATTACHMENT

14

March 25,1997

MR. James Coles

Alabama Department of Environmental Management

P.O. Box 301463

Montgomery, AL 36130-1463

Dear Mr. Coles:

**Attached is the Stormwater Sampling Data for the First Quarter,
January through March 1997, for the IMC Florence, Alabama facility.
If there are questions or comments please contact me at 205-764-7821.**

Sincerely,



Larry L. Larkin

Plant Manager

COMPANY: IMC RAINBOW

DSNOU 3

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering this information, I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Signing of Responsible Official:

Date _____

ADDEM:

COMPANY: IMC RAINBOW

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons furnishing the information, I am aware that there are significant penalties for submitting false information, including the possibility of fines, imprisonment, or other sanctions. I am aware that there are significant penalties for knowingly or recklessly falsifying any material information.

Jerry L. Fahn

Signature of Responsible Official

Date *3-25-97*

Florence, AL

QUARTER/ Jan/march, 199
NPDES NO. AL0022021

DSNOO 9

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Signing of Responsible Officials

Date _____

ADEM



LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-01
Date Sampled: 1997-03-05
Time Sampled: 1239

Parameter	Results	Method	Analyst	Date	Time
pH	6.65 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	2 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.07 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	30 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt".

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-02
Date Sampled: 1997-03-05
Time Sampled: 1243

Parameter	Results	Method	Analyst	Date	Time
pH	6.71 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	1 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.1 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	96 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-03
Date Sampled: 1997-03-05
Time Sampled: 1245

Parameter	Results	Method	Analyst	Date	Time
pH	6.97 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	3 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.07 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	108 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

March 24, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 009
Date Received: 03/06/1997
Purchase Order No.: IMC

Lab. No.: 1971-0657-04
Date Sampled: 1997-03-05
Time Sampled: 1247

Parameter	Results	Method	Analyst	Date	Time
pH	6.71 su	4500-H+ B	tb	03-06-97	1600
Oil and Grease	2 mg/L	5520B	tb	03-12-97	1000
Phosphorus (T)	0.1 mg/L	4500-P C	tb	03-14-97	1100
Nitrogen-Kjeldahl	1175 mg/L	4500-N C	tb	03-20-97	1300

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

IMC RAINBOW
FLORENCE,AL.

DATE: 3-5-97

**STORMWATER OUTFALL
FLOW RATES**

DAY: Wed.

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
12:39	DSN003 A	4.75	3 sec	1.58
12:43	DSN007 B	4.50	4 sec	1.13
12:45	DSN008 C	3.25	2 sec	1.63
12:47	DSN009 D	4.00	2 sec	2

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 003

Date: 3-5-97 Name of Sampler: David Cook

3. Revious rainfall end time: 2400 Military

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1230 Military

Sample time: 1239 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1700 Military

Total rainfall volume: .90

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket + stop watch
1.58 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 007
Date: 3-5-97 Name of Sampler: David Cook

3. Previous rainfall end time: 2400 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 1230 Military
Sample time: 1239 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 1700 Military
Total rainfall volume: .90
(Sampled rainfall event must be greater than 0.1 inches)

Bucket + stopwatch
1.13 gal/sec

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date

NPDES Permit # AL0022021

Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 3-5-97 Name of Sampler: David Cook

3. Previous rainfall end time: 2400 Military

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1230 Military

Sample time: 1239 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1700 Military

Total rainfall volume: .90

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

*Bucket + stopwatch
1.63 gal/sec*

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 009
Date: 3-5-97 Name of Sampler: Daniel Cook

3. Previous rainfall end time: 2400 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1230 Military

Sample time: 1239 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1700 Military

Total rainfall volume: .90

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket + stopwatch
2 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

RAINFALL MONITORING DATA SHEET
 NPDES PERMIT # AL0022021
 FLORENCE, AL

Maintain this log from the start of the quarter until the sampling event is conducted.

Date of Storm Event (MM/DD/YY)	Start Time (Military)	Time Ended (Military)	Rainfall (Inches)
1/8/97	8:20	↓	↓
1/9/97		23 00	1.0
1/10/97	12:30	22 00	.1 ^{snow}
1/16/97	1500	2100	.6
1/22/97	0530	0900	.4
1/23/97	1630		
1/24/97		1600	1.4
1/27/97	1800	2400	1.2
2/3/97	0430		
2/4/97		1400	.6
2/6/97	1700	2200	.40
2/7/97	1600	2100	.25
2/13/97	0545		
2/14/97		0800	.55
2/21/97	0600	1100	.95
2/27/97	01230	0530	.80
2/28/97	0500	0600	.60
3/1/97	0130	0530	.80
3/2/97	0500	2400	2.4
3/5/97	1230	1700	.90

SouthEastern



ANALYTICAL SERVICES, INC.

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: Imc

CLIENT/PROJECT SITE: Florence

PAGE: 1 OF: 1

CLIENT CONTACT: Gloria Isbell

PROJECT JOB NO.: 01-000000-01 (FOR LAB USE ONLY)

SAMPLE DESCRIPTION/LOCATION	TYPE		MATRIX TYPE	DATE SAMPLED	TIME	PRESERVATIVE	NUMBER OF CONTAINERS	COLLECTED BY:	ANALYSIS REQUESTED							
	GRB	COMP							01	02	03	04	05	06	07	08
97 -01	X		lig.						X	X						
-02									X	X						
-03									X	X						
-04									X	X						
-05												X				
-06												X				
-07												X				
-08												X				
-09													X	X		
-10													X	X		
-11													X	X		
-12													X	X		

TURNAROUND TIME REQUESTED:

REMARKS:

SHIPPED BY:

UPS: _____ CLIENT VEHICLE: _____

FEDX: _____ LAB VEHICLE: _____

OTHER: _____

RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	REASON:	RELINQUISHED TO LABORATORY BY:	ACCEPTED FOR LAB BY:	DATE:	TIME:
<u>Gloria Isbell</u>	<u>Gloria Isbell</u>	<u>3/6/99</u>						

LABORATORY COMMENTS:

December 18,1996

MR. James Coles

Alabama Department of Environmental Management

P.O. Box 301463

Montgomery, AL 36130-1463

Dear Mr. Coles:

**Attached is the Stormwater Sampling Data for the fourth quarter,
October through December 1996, for the IMC Florence, Alabama facility.
If there are questions or comments please contact me at 205-764-7821.**

Sincerely,

A handwritten signature in cursive script, reading "Larry L. Larkin". The signature is written in dark ink and is positioned above the printed name.

Larry L. Larkin

Plant Manager

QUARTER 4th Oct - Dec, 1923
NPDES NO. AL0022021

NPDES NO. AL0022021

PAIRAM

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who furnished the information, and those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of criminal sanctions and/or civil penalties for knowing violations.

12-18-96

ADDEM

ADEM DISCHARGE MONITORING REPORT

QUARTER 4 = Oct - Dec, 19

COMPANY: IMC RAINBOW

LOCATION: Union Street
Florence, AL

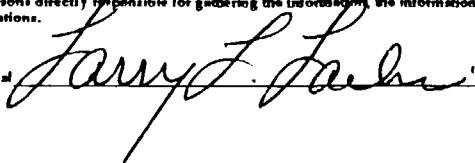
NPDES NO. AL0022021

DSN007

PARAM	Flow	pH	TKN	P.T	O&G		DSN008	Flow	pH	TKN	P.T	O & G		
MIN	-	MONITOR	-	-	-			-	MONITOR	-	-	-		
MAX	MONITOR	MONITOR	MONITOR	MONITOR	15			MONITOR	MONITOR	MONITOR	MONITOR	15		
MO. AVG	-	-	-	-	-			-	-	-	-	-		
FREQ	1/QTR	1/QTR	1/QTR	1/QTR	1/QTR			1/QTR	1/QTR	1/QTR	1/QTR	1/QTR		
UNITS	MGD	S.U.	mg/l	mg/l	mg/l			MGD	S.U.	mg/l	mg/l	mg/l		
DATE														
MAX														
MO. AVG														
DATE	9a/1/sec							9a/1/sec						
Sampled	0.2	6.34	109	1.9	2.9			0.12	6.55	121	1.7	2.4		
MAX														
MO. AVG														
DATE														
MAX														
MO. AVG														

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons managing the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine imprisonment for knowing violations.

Signing of Responsible Official



Date 12-19-96

ADEM 5

Florence, AL

QUARTER 4th Oct-Dec, 1990
NPDES NO. AL0022021

DSNOO 9

Signature of Responsible Official

Date _____

ADEM 5/

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35813-0303 • (205) 837-2972

LABORATORY REPORT

December 16, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN-003
Date Received: 12/02/1996
Purchase Order No.: IMC

Lab. No.: 1971-3376-01
Date Sampled: 1996-11-21
Time Sampled: 0830

Parameter	Results	Method	Analyst	Date	Time
pH	6.41 su	4500-H+ B	lv	12-02-96	1535
Oil and Grease	6 mg/L	5520B	lv	12-04-96	1250
Phosphorus (T)	1.6 mg/L	4500-P C	lv	12-05-96	1215
Nitrogen-Kjeldahl	39 mg/L	4500-N C	lv	12-11-96	1550

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt". The signature is written in a cursive, flowing style.

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35813-0303 • (205) 837-2972

LABORATORY REPORT

December 16, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN-007
Date Received: 12/02/1996
Purchase Order No.: IMC

Lab. No.: 1971-3376-02
Date Sampled: 1996-11-21
Time Sampled: 0834

Parameter	Results	Method	Analyst	Date	Time
pH	6.34 su	4500-H+ B	lv	12-02-96	1535
Oil and Grease	2.9 mg/L	5520B	lv	12-04-96	1250
Phosphorus (T)	1.9 mg/L	4500-P C	lv	12-05-96	1215
Nitrogen-Kjeldahl	109 mg/L	4500-N C	lv	12-11-96	1550

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt".

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35813-0303 • (205) 837-2972

LABORATORY REPORT

December 16, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN-008
Date Received: 12/02/1996
Purchase Order No.: IMC

Lab. No.: 1971-3376-03
Date Sampled: 1996-11-21
Time Sampled: 0836

Parameter	Results	Method	Analyst	Date	Time
pH	6.55 su	4500-H+ B	lv	12-02-96	1535
Oil and Grease	2.4 mg/L	5520B	lv	12-04-96	1250
Phosphorus (T)	1.7 mg/L	4500-P C	lv	12-05-96	1215
Nitrogen-Kjeldahl	121 mg/L	4500-N C	lv	12-11-96	1550

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt".

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

LABORATORY REPORT

December 16, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN-009
Date Received: 12/02/1996
Purchase Order No.: IMC


Lab. No.: 1971-3376-04
Date Sampled: 1996-11-21
Time Sampled: 0839

Parameter	Results	Method	Analyst	Date	Time
pH	6.08 su	4500-H+ B	lv	12-02-96	1535
Oil and Grease	13.4 mg/L	5520B	lv	12-04-96	1250
Phosphorus (T)	1.8 mg/L	4500-P C	lv	12-05-96	1215
Nitrogen-Kjeldahl	1260 mg/L	4500-N C	lv	12-11-96	1550

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

IMC RAINBOW

FLORENCE, AL.

DATE: 11-21-94

STORMWATER OUTFALL FLOW RATES

DAY: _____

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
8:30	DSN003 A	4	5	.8
8:34	DSN007 B	3	15	.2
8:36	DSN008 C	2.25	20	.12
8:39	DSN009 D	2	5	.4

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 003
Date: 11-21-96 Name of Sampler: David Cook

3. Previous rainfall end time: 11-28-96 17:00 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 08:15 Military
Sample time: 0830 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 0850 Military
Total rainfall volume: .15
(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Bucket + Stopwatch
.8 gal/sec

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 007
Date: 11-21-96 Name of Sampler: David Cook

3. Revious rainfall end time: 1700 Military 11-18-96
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 0815 Military
Sample time: 0834 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 0850 Military
Total rainfall volume: .15
(Sampled rainfall event must be greater than 0.1 inches)

*3 ac/et + 5 ft/sec
.2 gal/sec*

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long
5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 11-21-96 Name of Sampler: Dan Cook

3. Revious rainfall end time: 1700 Military 11-28

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 0815 Military

Sample time: 0836 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 0850 Military

Total rainfall volume: 0.15

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

*Bucket + Stopwatch
12 gal/sec*

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 009
Date: 11-21-96 Name of Sampler: Dan Cook

3. Previous rainfall end time: 1700 Military 11-18

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 0815 Military

Sample time: 0839 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 0850 Military

Total rainfall volume: .15

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

*Bucket + Stopwatch
4 gal/sec*

RAINFALL MONITORING DATA SHEET

NPDES PERMIT # AL0022021

FLORENCE, AL

Maintain this log from the start of the quarter until the sampling event is conducted.

[illegible]

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: INIC

CLIENT/PROJECT SITE: Florence

PAGE: 1 OF: 1

CLIENT CONTACT: Cheryl J. Siden

PROJECT JOB NO.: _____ (FOR LAB USE ONLY)

SAMPLE DESCRIPTION/LOCATION	TYPE		MATRIX TYPE	DATE SAMPLED	TIME	PRESERVATIVE	NUMBER OF CONTAINERS	COLLECTED BY:	ANALYSIS REQUESTED							
	GRB	COMP							Dil	Grease	PH	FT	PCN	AN	TH	OT
96 11-01	X		Water	11/21/96	8:35		1		X	X						
02					8:30				X	X						
03					8:36				X	X						
04					8:34				X	X						
05					8:30						X					
06					8:36						X					
07					8:34							X	X			
08					8:30							X	X			
09					8:34					X						
10					8:36							X	X			
11					8:39							X	X			
12					8:34						X					

TURNAROUND TIME REQUESTED: _____

REMARKS: _____

SHIPPED BY: _____

UPS: _____ CLIENT VEHICLE: _____

FEDX: _____ LAB VEHICLE: _____

OTHER: _____

RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	REASON:	RELINQUISHED TO LABORATORY BY:	ACCEPTED FOR LAB BY:	DATE:	TIME:
<u>X Shoria Labell</u>	<u>John Fisher</u>	<u>11/20/96</u>						

LABORATORY COMMENTS: _____



IMC Rainbow

IMC Rainbow
a division of
IMC Global Operations Inc.
P.O. Box 158
One Commerce Street
Florence, Alabama 35631
205.764.7821

September 5, 1996

**MR. James Coles
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463**

Dear Mr. Coles:

**Attached is the Stormwater Sampling Data for the third quarter,
July through September 1996, for the IMC Florence, Alabama facility.
If there are questions or comments please contact me at 205-764-7821.**

Sincerely,

Larry L. Larkin

Plant Manager

COMPANY: IMC RAINBOW

ADEM DISCHARGE MONITORING REPORT

QUARTER 3 July 2021
NPDES NO. AL0022021

LOCATION: Union Street
Florence, AL

DSN003

PARAM	Flow	pH	TKN	P.T	ORG	DSN004	Flow	pH	TKN	P.T	O & G
MIN	MONITOR	MONITOR	MONITOR	MONITOR	15		MONITOR	MONITOR	MONITOR	MONITOR	15
MAX	MONITOR	MONITOR	MONITOR	MONITOR	15		MONITOR	MONITOR	MONITOR	MONITOR	15
MO. AVG	1/OTR	1/OTR	1/OTR	1/OTR	1/OTR		1/OTR	1/OTR	1/OTR	1/OTR	1/OTR
UNITS	MGD	S.U.	MG/L	MG/L	MG/L		MGD	S.U.	MG/L	MG/L	MG/L
DATE	8/1/5c										
7/22	2.5	7.17	141	.08	1.89						
MAX											
MO AVG											
DATE											
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QUARTER 5th July - Dec, 1977
 NPDES NO. AI0027021

NPDES NO. AI0077071

Elaborando Al

DSNOOD	PARAM	Flow	pH	TKN	P.T	O&G	DSNOOD	Flow	pH	TKN	P.T	O & G
	MIN	-	MONITOR	-	-	-		-	MONITOR	-	-	-
	MAX	MONITOR	MONITOR	MONITOR	MONITOR	15		MONITOR	MONITOR	MONITOR	MONITOR	15
	MO. AVG	-	-	-	-	-		-	-	-	-	-
	FREQ	1/OIR	1/OIR	1/OIR	1/OIR	1/OIR		1/OIR	1/OIR	1/OIR	1/OIR	1/OIR
	UNITS	MGD	S.U.	MG/L	MG/L	MG/L		MGD	S.U.	MG/L	MG/L	MG/L
	DATE											
	<i>reled</i> 7/22	0.283	6.55	2150	0.14	1.33						
	MAX											
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I recently under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure the qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who furnished the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowingly providing false information, and I am aware that I am providing this information knowingly.

ADDITION

John J. Fisher

2-2-47

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

August 15, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 07/25/1996
Purchase Order No.: IMC

Lab. No.: 1971-2076-01
Date Sampled: 1996-07-22
Time Sampled: 1503

Parameter	Results	Method	Analyst	Date	Time
pH	7.17 su	4500-H+ B	tb	07/25/96	1600
Oil and Grease	1.89 mg/L	5520B	tb	08/06/96	1450
Phosphorus (T)	0.08 mg/L	4500-P C	tb	08/08/96	0925
Nitrogen-Kjeldahl	141 mg/L	4500-N C	tb	08/08/96	0925

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and
SSES
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

August 15, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 07/25/1996
Purchase Order No.: IMC

Lab. No.: 1971-2076-02
Date Sampled: 1996-07-22
Time Sampled: 1507

Parameter	Results	Method	Analyst	Date	Time
pH	7.15 su	4500-H+ B	tb	07/25/96	1600
Oil and Grease	1.44 mg/L	5520B	tb	08/06/96	1450
Phosphorus (T)	0.04 mg/L	4500-P C	tb	08/08/96	0925
Nitrogen-Kjeldahl	58.5 mg/L	4500-N C	tb	08/08/96	1150

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,



Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

August 15, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 07/25/1996
Purchase Order No.: IMC

Lab. No.: 1971-2076-03
Date Sampled: 1996-07-22
Time Sampled: 1509

Parameter	Results	Method	Analyst	Date	Time
pH	7.23 su	4500-H+ B	tb	07/25/96	1600
Oil and Grease	2.22 mg/L	5520B	tb	08/06/96	1450
Phosphorus (T)	0.07 mg/L	4500-P C	tb	08/08/96	0925
Nitrogen-Kjeldahl	64.7 mg/L	4500-N C	tb	08/08/96	1150

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

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Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

August 15, 1996

Client: IMC AgriBusiness, Inc.

Attention: Larry Hodge

Sample ID: DSN 009
Date Received: 07/25/1996
Purchase Order No.: IMC

Lab. No.: 1971-2076-04
Date Sampled: 1996-07-22
Time Sampled: 1511

Parameter	Results	Method	Analyst	Date	Time
pH	6.55 su	4500-H+ B	tb	07/25/96	1600
Oil and Grease	1.33 mg/L	5520B	tb	08/06/96	1450
Phosphorus (T)	0.14 mg/L	4500-P C	tb	08/08/96	0925
Nitrogen-Kjeldahl	2150 mg/L	4500-N C	tb	08/08/96	1150

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,



Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 003
Date: 7/22/96 Name of Sampler: David Cook

3. Revious rainfall end time: 7/16 2200 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1445 Military

Sample time: 1503 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1600 Military

Total rainfall volume: .50

(Sampled rainfall event must be greater than 0.1 inches)

Bucket & stopwatch
2.5 gal/sec

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 007
Date: 7/22/96 Name of Sampler: David Cook

3. Revious rainfall end time: 7/10 2200 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1445 Military

Sample time: 1507 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1600 Military

Total rainfall volume: .50

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket & stop watch
2.5 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 7/22/96 Name of Sampler: David Cook

3. Revious rainfall end time: 7/4 2200 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1445 Military

Sample time: 1509 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1600 Military

Total rainfall volume: .50

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket & stop watch
1 gal / sec.*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

IMC RAINBOW

FLORENCE, AL.

DATE: 7-22-96

STORMWATER OUTFALL
FLOW RATES

DAY: Monday

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
3:03	DSN003 A	5	2	2.5
3:07	DSN007 B	5	2	2.5
3:09	DSN008 C	3	3	1
3:11	DSN009 D	4.25	15	.283

SouthEastern



ANALYTICAL SERVICES, INC.

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: JMC

CLIENT/PROJECT SITE: Florence, AL

PAGE: <u>1</u> OF: <u>1</u>		CLIENT CONTACT: <u>Larry / Gloria</u>						PROJECT JOB NO.: _____ (FOR LAB USE ONLY)															
SAMPLE DESCRIPTION/LOCATION	TYPE		MATRIX TYPE	DATE SAMPLED	TIME	PRESERVATIVE	NUMBER OF CONTAINERS	COLLECTED BY:	ANALYSIS REQUESTED														
	GRB	COMP							Dilution	TKN	PH	Phosphorus											
962407 - 01	X		liquid	7-22-96	15:02		1	GI	X														
- 02					15:07				X														
- 03					15:11				X														
- 04					15:09				X														
- 05					15:11	H ₂ SO ₄				X													
- 06					15:09	H ₂ SO ₄				X													
- 07					15:07	H ₂ SO ₄				X													
- 08					15:03	H ₂ SO ₄				X													
- 09					15:07																		
- 10					15:09																		
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- 12					15:07																		
- 13					15:03																		
- 14					15:11																		
- 15					15:09																		
- 16					15:11																		

TURNAROUND TIME REQUESTED: _____

REMARKS: _____

SHIPPED BY: _____

UPS: _____ CLIENT VEHICLE: _____

FEDX: _____ LAB VEHICLE: _____

OTHER: _____

RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	REASON:	RELINQUISHED TO LABORATORY BY:	ACCEPTED FOR LAB BY:	DATE:	TIME:
<u>Gloria Abell</u>	<u>Jina Richey</u>	<u>7/24/96</u>	<u>14:10</u>		<u>Jina Richey</u>	<u>PS 2</u>	<u>7-24-96</u>	<u>410</u>

LABORATORY COMMENTS: _____



IMC Rainbow

IMC Rainbow
a division of
IMC Global Operations Inc.
P.O. Box 158
One Commerce Street
Florence, Alabama 35631

June 21, 1996

**Mr. James Coles
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463**

Dear Mr. Coles:

**Attached are the Stormwater Sampling Data for the second quarter,
April through June 1996, for the IMC Florence, Alabama facility.**

If there are questions or comments please contact me at 205-764-7821.

Sincerely,

**Larry L. Larkin
Plant Manager**

QUARTER 4 Apr. 1 - June, 1920
NPDES NO. AL0022021

NPDES NO. AL0022021

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure the qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who provided the system, or those persons directly responsible for gathering the information submitted to, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of imprisonment for knowing violations.

Signifying a Responsible Official

D. 2000

ADFM 5

LOCATION: Union Street
Florence, AL

QUARTER 2nd April - June, 1956
NPDES NO. AL0022021

COMPANY: IMC RAINBOW

DSNOO 9

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons managing the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine imprisonment for knowing violations.

Signing of Responsible Official

Date _____

6-18-96

ADEM 5

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 6, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 05/09/1996
Purchase Order No.: IMC


Lab. No.: 19711306D-01
Date Sampled: 1996-05-07
Time Sampled: 1044

Parameter	Results	Method	Analyst	Date	Time
pH	6.37 su	4500-H+ B	tb	05--09-96	1500
Oil and Grease	1.18 mg/L	5520B	tb	05-24-96	0945
Phosphorus (T)	0.1 mg/L	4500-P C	tb	05-23-96	1600
Nitrogen-Kjeldahl	905 mg/L	4500-N C	tb	05-21-96	1400

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 6, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 05/09/1996
Purchase Order No.: IMC

Lab. No.: 19711306D-02
Date Sampled: 1996-05-07
Time Sampled: 1047

Parameter	Results	Method	Analyst	Date	Time
pH	6.01 su	4500-H+ B	tb	05-09-96	1500
Oil and Grease	1.03 mg/L	5520B	tb	05-24-96	0945
Phosphorus (T)	0.09 mg/L	4500-P C	tb	05-23-96	1600
Nitrogen-Kjeldahl	65.6 mg/L	4500-N C	tb	05-21-96	1400

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and
SSES
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303
Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 6, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 05/09/1996
Purchase Order No.: IMC


Lab. No.: 19711306D-03
Date Sampled: 1996-05-07
Time Sampled: 1051

Parameter	Results	Method	Analyst	Date	Time
pH	5.97 su	4500-H+ B	tb	05-09-96	1500
Oil and Grease	1.05 mg/L	5520B	tb	05-24-96	0945
Phosphorus (T)	0.1 mg/L	4500-P C	tb	05-23-96	1600
Nitrogen-Kjeldahl	148 mg/L	4500-N C	tb	05-21-96	1400

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and
SSES
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

June 6, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: DSN 009
Date Received: 05/09/1996
Purchase Order No.: IMC


Lab. No.: 19711306D-04
Date Sampled: 1996-05-07
Time Sampled: 1055

Parameter	Results	Method	Analyst	Date	Time
pH	6.38 su	4500-H+ B	tb	05-09-96	1500
Oil and Grease	1.02 mg/L	5520B	tb	05-24-96	1400
Phosphorus (T)	0.1 mg/L	4500-P C	tb	05-23-96	1600
Nitrogen-Kjeldahl	10,400 mg/L	4500-N C	tb	05-21-96	1400

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 003
Date: 5/7/96 Name of Sampler: David Cook

3. Revious rainfall end time: 4/29 1900 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 1035 Military
Sample time: 1044 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 1700 Military
Total rainfall volume: .25
(Sampled rainfall event must be greater than 0.1 inches)

Bucket + Stopwatch
1 gal / sec

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec / _____ feet
Surface area of flow: _____ wide X _____ long
5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 007
Date: 5/7/96 Name of Sampler: David Cook

3. Revious rainfall end time: 4/29/1900 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 1035 Military
Sample time: 1047 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 1700 5/7/96 Military
Total rainfall volume: .25
(Sampled rainfall event must be greater than 0.1 inches)

Bucket
+
Stopwatch
.679 gal/sec

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long
5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 5/7/96 Name of Sampler: David Cook

3. Revious rainfall end time: 4/29 1900 Military

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 1035 Military

Sample time: 1051 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1700 5/7/96 Military

Total rainfall volume: .25

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket + Stopwatch
.217 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 009
Date: 5/7/96 Name of Sampler: Dav. D Cook

3. Revious rainfall end time: 4/29 1900 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 1035 Military
Sample time: 1055 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 1700 Military
Total rainfall volume: .25
(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long

*Bucket + Stopwatch
.05 gal/sec*

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method used, and the analytical results.

IMC RAINBOW
FLORENCE, AL.

DATE: 5/7/96

**STORMWATER OUTFALL
FLOW RATES**

DAY: Tuesday

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
10:44	DSN003 A	4	4	1
10:47	DSN007 B	4.75	7	.679
10:51	DSN008 C	3.25	15	.217
10:55	DSN009 D	1	20	.05

October 1995
APPENDIX E

October 1995
APPENDIX E

October 1995
APPENDIX E

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: IMC

CLIENT/PROJECT SITE: Fluence

PAGE: 1 OF: 1

CLIENT CONTACT: _____

PROJECT JOB NO.: _____ (FOR LAB USE ONLY)

SAMPLE DESCRIPTION/LOCATION	TYPE		MATRIX TYPE	DATE SAMPLED	TIME	PRESERVATIVE	NUMBER OF CONTAINERS	COLLECTED BY:	ANALYSIS REQUESTED									
	GRB	COMP																
960705I-01	X		Water	5/1/96	10:30				X	X								
02	X		"	"	10:41				X	X								
03	X		"	"	10:44				X	X								
04	X		"	"	10:51				X	X								
05	X		"	"	11:05							X						
06	X		"	"	10:47							X						
07	X		"	"	10:47								X	X				
08	X		"	"	10:55								X	X				
09	X		"	"	10:44							X						
10	X		"	"	10:44								X	X				
11	X		"	"	10:51								X	X				
12	X		"	"	10:51							X						

TURNAROUND TIME REQUESTED: _____

REMARKS: _____

SHIPPED BY: _____

UPS: _____ CLIENT VEHICLE: _____

FEDX: _____ LAB VEHICLE: _____

OTHER: _____

RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	REASON:	RELINQUISHED TO LABORATORY BY:	ACCEPTED FOR LAB BY:	DATE:	TIME:
<u>Sharon L. Bell</u>	<u>Lina Richey</u>	<u>5/1/96</u>	<u>11:50</u>					

LABORATORY COMMENTS: _____

Z 315 843 989

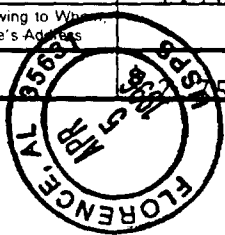


**Receipt for
Certified Mail**

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to	
Alabama Dept. of Environ.	
Street and No.	
P.O. Box 301463	
P.O., State and ZIP Code	
Montgomery, Al. 36130	
Postage	\$.55
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	1.10
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	
Postmark or Date	



COMPANY: IMC RAINBOW

ADEM DISCHARGE MONITORING REPORT

LOCATION: Union Street
Florence, AL

QUARTER 1st Jan-Mar, 1996
NPDES NO. AL002201

DSNOO 3

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine imprisonment for knowingly submitting false information.

Signature of Responsible Official

D. 2000

ADAM 3

COMPANY: IMC RAINBOW

ADEM DISCHARGE MONITORING REPORT

LOCATION: Union Street
Florence, AL

QUARTER 1st Jan-Mar, 1996
NPDES NO. AL002201

DSNOO 9

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signaling of Responsible Official

D.

4/5/96

ADEM 51

QUARTER 1st Jan-Mar, 1996
NPDES NO. AL0022021

COMPANY: IMC RAINBOW

DSNOOZ

DSN00 8

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons managing the system, I am not aware of any person who has provided false or misleading information. I am not aware of any person who has knowingly violated any system of internal controls designed to ensure that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine imprisonment or knowing violations.

Signatures of Responsible Officials

Date _____

ADEM

Southeastern Safety and
SSES
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

MARCH 29, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: Outfall A DSN003
Date Received: 03/07/1996
Purchase Order No.: IMC Rainbow

Lab. No.: 1971-0676-01
Date Sampled: 1996-03-05
Time Sampled: 0902

Parameter	Results	Method	Analyst	Date	Time
pH	6.42 su	4500-H+ B	tb	03-07-96	1500
Oil and Grease	1.5 mg/L	5520B	tb	03-22-96	1400
Phosphorus (T)	0.14 mg/L	4500-P C	tb	03-22-96	1015
Nitrogen-Kjeldahl	< 1.0 mg/L	4500-N C	tb	03-26-96	1500

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,



Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

MARCH 29, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: Outfall B DSN007
Date Received: 03/07/1996
Purchase Order No.: IMC Rainbow

Lab. No.: 1971-0676-02
Date Sampled: 1996-03-05
Time Sampled: 0905

Parameter	Results	Method	Analyst	Date	Time
pH	6.21 su	4500-H+ B	tb	03-07-96	1500
Oil and Grease	1.6 mg/L	5520B	tb	03-22-96	1400
Phosphorus (T)	0.13 mg/L	4500-P C	tb	03-22-96	1015
Nitrogen-Kjeldahl	< 1.0 mg/L	4500-N C	tb	03-26-96	1500

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt", is written over the typed name.

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and

SS&S



Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT

MARCH 29, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: Outfall C DSN008
Date Received: 03/07/1996
Purchase Order No.: IMC Rainbow

Lab. No.: 1971-0676-03
Date Sampled: 1996-03-05
Time Sampled: 0907

Parameter	Results	Method	Analyst	Date	Time
pH	6.45 su	4500-H+ B	tb	03-07-96	1500
Oil and Grease	1.4 mg/L	5520B	tb	03-22-96	1400
Phosphorus (T)	0.13 mg/L	4500-P C	tb	03-22-96	1015
Nitrogen-Kjeldahl	< 1.0 mg/L	4500-N C	tb	03-26-96	1500

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Southeastern Safety and
SS&S 
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303

Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT
MARCH 29, 1996

Client: IMC Fertilizer, Inc.

Attention: Larry Hodge

Sample ID: Outfall D DSN009
Date Received: 03/07/1996
Purchase Order No.: IMC Rainbow

Lab. No.: 1971-0676-04
Date Sampled: 1996-03-05
Time Sampled: 0910

Parameter	Results	Method	Analyst	Date	Time
pH	6.22 su	4500-H+ B	tb	03-07-96	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	03-22-96	1400
Phosphorus (T)	0.16 mg/L	4500-P C	tb	03-22-96	1015
Nitrogen-Kjeldahl	< 1.0 mg/L	4500-N C	tb	03-26-96	1500

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,



Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 003
Date: 3/5/96 Name of Sampler: L.R. Hodge

- 2/27 2200
3. Revious rainfall end time: ~~2/27~~ Military

**** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE SAMPLED RAINFALL EVENT.**

Rainfall start time: 3/5 0850 Military

Sample time: 0902 Military (A grab sample shall be taken during the first thirty minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 3/6 1100 Military

Total rainfall volume: 2.0

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

Bucket & stopwatch
.555 gal/sec

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 007
Date: 3/5/96 Name of Sampler: J.R. Hodge

3. Revious rainfall end time: 2/27 2200 Military

**** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.**

Rainfall start time: 3/5 0850 Military

Sample time: 3/5 0905 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 3/6 1100 Military

Total rainfall volume: 2.0

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

*Bucket & stopwatch
0.385 gal/sec*

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 3/5/96 Name of Sampler: L.R. Hodge

3. Revious rainfall end time: 2/27 2200 Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 3/5 0850 Military
Sample time: 3/5 0907 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 3/6 1100 Military
Total rainfall volume: 2.0
(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long

*Bucket & stopwatch
400 gal/sec*

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 009
Date: 3/5/96 Name of Sampler: J.R. Hodge

3. Revious rainfall end time: 2/27 0200 Military

**** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.**

Rainfall start time: 3/5 0850 Military

Sample time: 3/5 0910 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 3/6 1100 Military

Total rainfall volume: 2.0

(Sampled rainfall event must be greater than 0.1 inches)

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

*Bucket & stopwatch
.0292 gal/sec*

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

IMC RAINBOW
FLORENCE, AL.

DATE: 3/5/96

**STORMWATER OUTFALL
FLOW RATES**

DAY: Tuesday

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
9:03 AM	A 3	5	9	.5555
9:05 AM	B 7	5	13	.3846
9:07 AM	C 8	2	5	.4000
9:10 AM	D 9	1.75	60	.0292

RAINFALL MONITORING DATA SHEET
 NPDES PERMIT # AL0022021
 FLORENCE, AL

Maintain this log from the start of the quarter until the sampling event is conducted.

Date of Storm Event (MM/DD/YY)	Start Time (Military)	Time Ended (Military)	Rainfall (Inches)
1/5/96	1350		
1/6/96		1700	1.20
1/11	1000	1900	0.85
1/18	1215	1730	0.60
1/23	2230	0230	0.85
1/26	0530	1900	0.85
1/29	0745		
1/30		2230	0.35
2/1/96	1600		
2/2/96		1700	1.30
2/7	0700	1200	< 0.10
2/9	1000	2000	0.40
2/27	2000	2200	0.85
3/5/96	0850	1245 Still Raining	0.40
3/6/96	0850	1100	2.00

**ANALYTICAL SERVICES, INC.**

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: IMC Rainbow
P.O. Box 158
Florence, AL 35631
CLIENT CONTACT: Lassy Hodge - Gloria Isbell

CLIENT/PROJECT SITE: Florence, AL

PROJECT JOB NO.: (FOR LAB USE ONLY)

[illegible]

June 2, 1997

MR. James Coles

Alabama Department of Environmental Management

P.O. Box 301463

Montgomery, AL 36130-1463

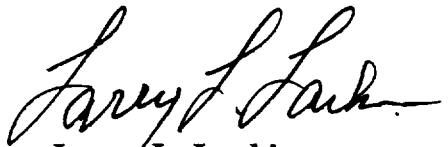
Dear Mr. Coles:

Attached is the Stormwater Sampling Data for the Second Quarter,

April through June 1997, for the IMC Florence, Alabama facility.

If there are questions or comments please contact me at 205-764-7821.

Sincerely,

A handwritten signature in cursive script, reading "Larry L. Larkin".

Larry L. Larkin

Plant Manager

QUARTER April / June, 1977
NPDES NO. AL0022021

Florence, AL

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who furnished the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of imprisonment for knowing violations.

NOTE

David T. Tuck
June 4, 1997

LOCATION: Union Street
Florence, AL

QUARTER April / June, 1997
NPDES NO. AL0022021

COMPANY: IMC RAINBOW

DSNOO 9

[illegible]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Responsible Official

Larry L. Larkin

D=

Date June 4 1997

Southeastern Safety and
SSES
Environmental Services, Inc.

P.O. Box 14231 • Huntsville, AL 35815-0303
Ph. (205) 837-2972 • 1-800-562-3114 • FAX (205) 830-5053

LABORATORY REPORT
June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 003
Date Received: 05/20/1997
Purchase Order No.: IMC


Lab. No.: 1971-1407-03
Date Sampled: 1997-05-19
Time Sampled: 0947

Parameter	Results	Method	Analyst	Date	Time
pH	6.62 su	4500-H+ B	tb	05-28-97	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	2.99 mg/L	4500-P C	tb	05-27-97	1330
Nitrogen-Kjeldahl	23 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 007
Date Received: 05/20/1997
Purchase Order No.: IMC

Lab. No.: 1971-1407-01
Date Sampled: 1997-05-19
Time Sampled: 0942

Parameter	Results	Method	Analyst	Date	Time
pH	6.62 su	4500-H+	E tb	05-20-97	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	2.64 mg/L	4500-P	C tb	05-27-97	1530
Nitrogen-Kjeldahl	5 mg/L	4500-N	C tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt".

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 008
Date Received: 05/20/1997
Purchase Order No.: IMC


Lab. No.: 1971-1407-04
Date Sampled: 1997-05-19
Time Sampled: 0936

Parameter	Results	Method	Analyst	Date	Time
pH	6.36 su	4500-H+ B	tb	05-20-97	1500
Oil and Grease	1 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	3.23 mg/L	4500-P C	tb	05-27-97	1330
Nitrogen-Kjeldahl	10 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,


Dennis W. Mynatt, MS, CHMM
President and Principal Engineer



LABORATORY REPORT

June 2, 1997

Client: IMC AgriBusiness

Attention: Larry Hodge

Sample ID: DSN 009
Date Received: 05/20/1997
Purchase Order No.: IMC

Lab. No.: 1971-1407-02
Date Sampled: 1997-05-19
Time Sampled: 0938

Parameter	Results	Method	Analyst	Date	Time
pH	6.25 su	4500-H+ B	tb	05-20-97	1500
Oil and Grease	< 1.0 mg/L	5520B	tb	05-28-97	0950
Phosphorus (T)	3.34 mg/L	4500-P C	tb	05-27-97	1330
Nitrogen-Kjeldahl	325 mg/L	4500-N C	tb	05-28-97	1330

Method Sources

EPA-Test Methods for Evaluating Solid Waste, SW-846 3rd Ed.
EPA-Methods for Chemical Analysis of Water and Wastes (1983)
Standard Methods for the Examination of Water and Waste-
water, 18th Ed.
40 CFR Part 136

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dennis W. Mynatt".

Dennis W. Mynatt, MS, CHMM
President and Principal Engineer

IMC RAINBOW
FLORENCE, AL.

DATE: 5-19-97

**STORMWATER OUTFALL
FLOW RATES**

DAY: Monday

TIME	OUTFALL NO.	VOLUME INTO CONTAINER (GAL)	TIME TO FILL (SEC)	FLOW GAL / SEC
9:47	DSN003 A	3.25	11	.295
9:42	DSN007 B	2.75	12	.229
9:36	DSN008 C	2.25	10	.225
9:38	DSN009 D	2.50	5	.5

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 009
Date: 5-19-97 Name of Sampler: David Cook

3. Previous rainfall end time: _____ Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 0920 Military

Sample time: 0938 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1130 Military

Total rainfall volume: .2

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket & stopwatch
.5 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant
2. Sampled outfall permit ID #: DSN 003
Date: 5-19-97 Name of Sampler: David Cook
3. Previous rainfall end time: _____ Military
** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.
Rainfall start time: 0920 Military
Sample time: 0947 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).
Rainfall end time: 1130 Military
Total rainfall volume: .2
(Sampled rainfall event must be greater than 0.1 inches)

*Bucket + Stopwatch
.295 gal/sec*
4. Flow Calculation Data:
Flow depth in inches: _____
Float time/distance: _____ sec/ _____ feet
Surface area of flow: _____ wide X _____ long
5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.
6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN~~00~~7
Date: 5-19-97 Name of Sampler: David Cook

3. Revious rainfall end time: Military

** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.

Rainfall start time: 0920 Military

Sample time: 0942 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1130 Military

Total rainfall volume: .2

(Sampled rainfall event must be greater than 0.1 inches)

Bucket + Stopwatch
.229 gal/sec

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

Storm Water Sampling Date
NPDES Permit # AL0022021
Florence, AL

1. IMC Rainbow, Florence, AL Granulation Plant

2. Sampled outfall permit ID #: DSN 008
Date: 5-19-97 Name of Sampler: David Cook

3. Revious rainfall end time: _____ Military

**** THERE MUST BE A MINIMUM 72 HOUR GAP BETWEEN THIS RAINFALL AND THE
SAMPLED RAINFALL EVENT.**

Rainfall start time: 0920 Military

Sample time: 0936 Military (A grab sample shall be taken during the first thirty
minutes of the discharge or as soon thereafter as practicable).

Rainfall end time: 1130 Military

Total rainfall volume: .2

(Sampled rainfall event must be greater than 0.1 inches)

*Bucket + stopwatch
.225 gal/sec*

4. Flow Calculation Data:

Flow depth in inches: _____

Float time/distance: _____ sec/ _____ feet

Surface area of flow: _____ wide X _____ long

5. Complete chain of custody form and other laboratory supplied forms as needed prior to shipment to
lab.

6. Attach the returned lab report, which must include the date and time of analysis, the analyst's name, the method
used, and the analytical results.

SouthEastern



ANALYTICAL SERVICES, INC.

1004 Oster Drive, Suite 1
Huntsville, Alabama 35816
(205) 536-8110

CHAIN OF CUSTODY/FIELD DATA SHEET

CLIENT: IMC - Rainbow

CLIENT/PROJECT SITE: Florence

PAGE: 1 OF: 1

CLIENT CONTACT:

PROJECT JOB NO.: (FOR LAB USE ONLY)

SAMPLE DESCRIPTION/LOCATION	TYPE		MATRIX TYPE	DATE SAMPLED	TIME	PRESERVATIVE	NUMBER OF CONTAINERS	COLLECTED BY:	ANALYSIS REQUESTED									
	GRB	COMP																
97 DSN-007 Phosphorus (P)	✓			5/19/97	9:42	H ₂ SO ₄	1											
↓ (Field soil) N				"	"	"	1											
↓ pH				"	"	Ca	1											
DSN-009 Kjeldahl N				"	9:38	H ₂ SO ₄	1											
↓ Phosphorus (P)				"	"	"	1											
↓ pH				"	"	Ca	1											
DSN-003 Kjeldahl N				"	9:47	H ₂ SO ₄	1											
↓ Phosphorus (P)				"	"	"	1											
↓ pH				"	"	Ca	1											
DSN-008 Kjeldahl N				"	9:36	H ₂ SO ₄	1											
↓ Phosphorus (P)				"	"	"	1											
↓ pH				"	"	Ca	1											
↓ O×G				"	"	H ₂ SO ₄	1											
DSN-003 O×G				"	9:47	H ₂ SO ₄	1											
DSN-007 O×G				"	9:42	"	1											
DSN-009 O×G				"	9:38	"	1											

TURNAROUND TIME REQUESTED:

REMARKS:

SHIPPED BY:

UPS: CLIENT VEHICLE:

FEDX: LAB VEHICLE:

OTHER:

RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	REASON:	RELINQUISHED TO LABORATORY BY:	ACCEPTED FOR LAB BY:	DATE:	TIME:
					<i>[Signature]</i>	<i>[Signature]</i>		

LABORATORY COMMENTS:

ATTACHMENT

15

SPILL/RELEASE REPORTING FORM
IMC FERTILIZER, INC
RAINBOW DIVISION

cc: DIV. V-P CORP. SAFETY
ZONE MAN. ZONE PROD. MAN.
SAF/ENV SUPERVISOR

FACILITY: IMCF Florence, AL EPA ID. NO.: _____

MANAGER: W.W. Thorne REPORT DATE: 4-26-91

SPILL DATE: 4-22-91 SPILL TIME: 1230 AM TIL 1245 @m/pm

MATERIAL SPILLED/RELEASED: APP-MA2 Coating Agent 3015

AMOUNT SPILLED: 200 Gal (Est) AMOUNT RECOVERED: 100 Gal (Est)

AMOUNT NOT RECOVERED: 100 (GIVE SPECIFIC AMOUNTS)

SPECIFIC LOCATION OF SPILL: STG. TANK Near Granulation Unit

CAUSE OF SPILL: Employee Transferring Material from one
TANK into another - TANK over filled

METHOD(S) USED TO CONTROL SPILL/RELEASE: Sand - Super phosphate
inside dike area - wheat straw to remove material
from small stream (Sweetwater Creek)

DISPOSITION OF RECOVERED MATERIAL: Stored on site will
feed small amount of sand and phosphate back into process

FATE OF NON-RECOVERED MATERIAL: Some lost in Tenn. River
Some in soil.

RECOVERY DATE: 4-22-91 RECOVERY TIME 8:00 AM TIL 6:00 PM am/pm

LIST ALL EMPLOYEES INVOLVED IN SPILL/RELEASE: Hassell Greed,
Edith Anderson

LIST ALL EMPLOYEES INVOLVED IN RECOVERY: John Thigpen, Ricky
Clemens, Larry Larkins, ENTIRE Granulation Crew

LIST ALL IMC RESPONSE PERSONNEL CONTACTED, GIVE DATE & TIME:

Tim Smith 4-22-91 3:01 PM -

LIST ALL GOVERNMENT RESPONSE AGENCIES CONTACTED, DATE & TIME:
(Indicate if a representative(s) was sent to the scene.)

Local Emergency Management officer (George Mangum) - 4-22-91 2:00 PM

N.R.C. Mark Brantley - 4-22-91 3:01 PM (A.D.E.M. Montgomery A! - 4-22-91 3:50 PM)

LIST ALL PRESS CONTACTS, GIVE TYPE OF CONTACT, DATE & TIME:

NONE

****ATTACH A COPY OF ALL RELATED INJURY & PROPERTY DAMAGE REPORTS****

SPILL/RELEASE REPORTING FORM
IMC FERTILIZER, INC
RAINBOW DIVISION

cc: DIV. V-P CORP. SAFETY
ZONE MAN. ZONE PROD. MAN.
SAF/ENV SUPERVISOR

FACILITY: Florence, AL EPA ID. NO.: _____

MANAGER: Larry L. Larkin REPORT DATE: 01-29-92

SPILL DATE: 01-29-92 SPILL TIME: 11:00 AM TIL 11:07 am/pm

MATERIAL SPILLED/RELEASED: 93% Sulfuric Acid

AMOUNT SPILLED: 500 EST AMOUNT RECOVERED: 500 EST

AMOUNT NOT RECOVERED: _____ (GIVE SPECIFIC AMOUNTS)

SPECIFIC LOCATION OF SPILL: Railspur North side of plant.

CAUSE OF SPILL: Runaway car from TSRR switch yard came into plant at approximately 20 to 25 MPH hitting a parked tank car.

METHOD(S) USED TO CONTROL SPILL/RELEASE: Agricultural Limestone

DISPOSITION OF RECOVERED MATERIAL: Will be used back into the process of manufacturing fertilizer.

FATE OF NON-RECOVERED MATERIAL: _____

RECOVERY DATE: 1-29-92 RECOVERY TIME 3:30PM TIL 9:30 am/pm

LIST ALL EMPLOYEES INVOLVED IN SPILL/RELEASE: None

LIST ALL EMPLOYEES INVOLVED IN RECOVERY: Larry Hodge, Bobby Hooper,

J. Mark Gay, John Thigpen, Jerry Crittenden, Ronnie Davis

LIST ALL IMC RESPONSE PERSONNEL CONTACTED, GIVE DATE & TIME:

Jim Smith - 01-29-92 - 11:20 A.M.

LIST ALL GOVERNMENT RESPONSE AGENCIES CONTACTED, DATE & TIME:
(Indicate if a representative(s) was sent to the scene.)

(See attached list)

LIST ALL PRESS CONTACTS, GIVE TYPE OF CONTACT, DATE & TIME:

None

****ATTACH A COPY OF ALL RELATED INJURY & PROPERTY DAMAGE REPORTS****

AGENCIES NOTIFIED OF SULFURIC ACID SPILL - 01-29-92

1. LOCAL EMA - 1-205-766-4201 - MRS. DUSTER
2. ALABAMA EMERGENCY RESPONSE - 1-205-271-7700 - L. G. LYNN
3. NATIONAL RESPONSE CENTER - 1-800-424-8802 - PETTY OFFICER
STILLWAGON - REPORT NO. 105005
4. ADEM - 1-205-271-7755 - DAVE DAVIS
5. FRA (MEMPHIS) 1-901-544-3972 - NORRIS FULFORD
6. EPA (GEORGIA) - 1-404-347-3931 - MATT TAYLOR

NO REPRESENTATIVES WERE SENT TO THE SCENE.



January 30, 1992

Mr. Dave Davis
ADEM
North Unit RCRA
1751 Dickinson Drive
Montgomery, Alabama 36130

Dear Mr. Davis:

This letter will confirm our phone conversation regarding the solid waste created by a sulfuric acid spill occurring at IMC Fertilizer, Inc., plant in Florence, Alabama on January 29, 1992.

At 11:00 A. M., January 29, 1992 a runaway tank car from the Tennessee Southern Switch Yard at Florence, Alabama came into the plant, hitting a parked tank car.

The collision forced the parked car upon an embankment hitting the column supporting a pipe rack. The pipe rack fell, rupturing a sulfuric acid line. Before the valve could be shut off approximately 500 gallons of 93% sulfuric acid spilled.

Immediately the spill was confined by surrounding it with agricultural limestone. Once the spill was confined the acid was neutralized by mixing limestone in with the acid.

After neutralization the waste material (now all solid) was picked up and moved inside the raw material building. As we normally use sulfuric acid and limestone in the fertilizer manufacturing process, this solid waste material will be used back into the process.

Sincerely,

A handwritten signature in cursive script that reads "Larry L. Larkin".

L. L. Larkin
Plant Manager

LLL/jc

Copy: Jim Smith

SPILL/RELEASE REPORTING FORM
IMC FERTILIZER, INC
RAINBOW DIVISION

cc: B.S. Turner N. Patterson
L.L. Larkin L.R. Hodge
J.W. Smith SUPERVISOR

FACILITY: Florence, AL EPA ID. NO.: ALD004018800

MANAGER: Larry Larkin REPORT DATE: 8/31/92

SPILL DATE: 8/31/92 SPILL TIME: 8:30 TIL 8:45 (am/pm)

MATERIAL SPILLED/RELEASED: D/C Scrubber Water

estimates { AMOUNT SPILLED: 3000 gal AMOUNT RECOVERED: 2000 gal

AMOUNT NOT RECOVERED: 1000 gal (GIVE SPECIFIC AMOUNTS)

SPECIFIC LOCATION OF SPILL: Dryer/Cooler Scrubber Basin

CAUSE OF SPILL: 4" Valve/Pipe broke off at bottom of D/C
scrubber basin - scrubber liquid @ 5.7 pH

METHOD(S) USED TO CONTROL SPILL/RELEASE: Plugged outlet
pipe and contained spill with sand

DISPOSITION OF RECOVERED MATERIAL: Mixed with sand filler
and recycled into the production process

FATE OF NON-RECOVERED MATERIAL: lost to Sweetwater Creek -
Tennessee River

RECOVERY DATE: 8/31/92 RECOVERY TIME 8:45 TIL 9:30 am/pm

LIST ALL EMPLOYEES INVOLVED IN SPILL/RELEASE: J.T. Marshall,
R. Davis, W. Davis

LIST ALL EMPLOYEES INVOLVED IN RECOVERY: J.T. Marshall,
R. Davis, W. Davis

LIST ALL IMC RESPONSE PERSONNEL CONTACTED, GIVE DATE & TIME:

JW Smith 8/31/92 @ 10:30a B.S. Turner 8/31/92 @ 10:40a
WW Patterson 8/31/92 @ 2:03p

LIST ALL GOVERNMENT RESPONSE AGENCIES CONTACTED, DATE & TIME:
(Indicate if a representative(s) was sent to the scene.)

ADEM, Jim Coles 8/31/92 @ 11:05am

LIST ALL PRESS CONTACTS, GIVE TYPE OF CONTACT, DATE & TIME:

****ATTACH A COPY OF ALL RELATED INJURY & PROPERTY DAMAGE REPORTS****

NPDES Permit # AL0022021 - A non-permitted release.



FERTILIZER, INC.

September 1, 1992

Mr. Tom R. Cleveland
Alabama Department of Environmental Management.
Industrial Branch
Water Division
1751 Cong. W. L. Dickinson Drive
Montgomery, Alabama 36130

RE: Non-permitted release at IMC Fertilizer, Inc.
Florence, AL - NPDES Permit # AL0022021

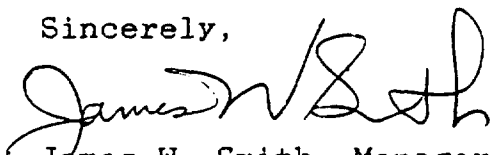
Dear Mr. Cleveland:

On August 31, 1992 at approximately 8:30 a.m. a 4" drain valve and pipe broke on the bottom outlet of the dryer/cooler scrubber basin. Prompt response held the release to approximately 3000 gallons, with only 1000 gallons reaching Sweetwater Creek. The remaining 2000 gallons was recovered and reprocessed.

The 1000 gallons lost had a pH 5.7 and contained some crop nutrients from our scrubbing system. A 24-hour follow-up inspection was performed today. The creek shows no signs of vegetative or aquatic life damage and is running clear. We do not anticipate a negative impact on the creek from this release.

If you have any questions, please give me a call at (912) 924-6101, ext. 131.

Sincerely,


James W. Smith, Manager
Safety, Environmental,
and Quality Control

cc: B. S. Turner
L. L. Larkin✓
J. M. Gay
L. R. Hodge

IMC RAINBOW

ENV. MAN. INSURANCE-MUN
GEN. MAN.

NOTE: THIS FORM MUST BE COMPLETED TO THE EXTENT FEASIBLE AND
DISTRIBUTED WITHIN 24 HOURS OF A SPILL/RELEASE.

FACILITY: Florence, Al. EPA ID NO.: _____

STREET ADDRESS: # 1 Commerce Street

CITY, STATE, ZIP: Florence, Al. 35631

MANAGER: Larry Larkin REPORT DATE: 1/11/96

SPILL DATE: 1/11/96 SPILL TIME Unknown TIL 8:05 AM/PM

MATERIAL SPILLED/RELEASED: # 2 Fuel Oil

AMOUNT SPILLED: 750 Gal. AMOUNT RECOVERED: 740 Gal.

AMOUNT NOT RECOVERED: 10 Gal. (GIVE SPECIFIC AMOUNTS)

SPECIFIC LOCATION OF SPILL: 10,000 Gal diesel fuel tank.

CAUSE OF SPILL: Tank drain line froze, forcing 2" pipe plug out
of valve-valve defective (old) would not cut off.

METHOD(S) USED TO CONTROL SPILL/RELEASE: Collected in dike
around tanks.

DISPOSITION OF RECOVERED MATERIAL: Pumped into oil-water
separator. Plan to recover and use.

FATE OF NON-RECOVERED MATERIAL: Rain started when most of the oil
was pumped out of dike. the oil not recovered will float on top
of rainwater. This will be put into oil water separator.

RECOVERY DATE: 1/11/96 RECOVERY TIME: 9:00A.M. TIL 10:30 AM/PM

COMMENTS: Elton Smith reported the spill at approximately 8:05 A.M.

ATTACH THE FOLLOWING:

1. LIST ALL EMPLOYEES INVOLVED IN SPILL/RELEASE
2. LIST ALL EMPLOYEES INVOLVED IN RECOVERY
3. LIST ALL IMC RESPONSE CONTACTS, GIVE DATE & TIME
4. LIST ALL GOVERNMENT AGENCIES CONTACTED, DATE & TIME
(Indicate if a representative(s) was sent to the scene)
5. LIST ALL PRESS CONTACTS, TYPE OF CONTACT, DATE & TIME
6. A COPY OF ALL RELATED INJURY & PROPERTY DAMAGE REPORTS.

TOTAL ATTACHMENTS = _____

Employees involved in recovery:

John Thigpen
Troy Connelly
Darrell Peebles

Mark Gay
Larry Larkin
Bobby Neal

IMC RAINBOW

ENV. MAN. INSURANCE-MUN
GEN. MAN.

NOTE: THIS FORM MUST BE COMPLETED TO THE EXTENT FEASIBLE AND
DISTRIBUTED WITHIN 24 HOURS OF A SPILL/RELEASE.

FACILITY: Florence, Al. EPA ID NO.: _____

STREET ADDRESS: # 1 Commerce Street

CITY, STATE, ZIP: Florence, Al. 35631

MANAGER: Larry Larkin REPORT DATE: 4/24/96

SPILL DATE: 4/23/96 SPILL TIME: 9:00 AM TIL 4:00 AM/PM

MATERIAL SPILLED/RELEASED: 78% Sulfuric Acid

AMOUNT SPILLED: 200 gal AMOUNT RECOVERED: All

AMOUNT NOT RECOVERED: _____ (GIVE SPECIFIC AMOUNTS)

SPECIFIC LOCATION OF SPILL: #2 Acid Tank (45,000 Gal)(Inside dike)

CAUSE OF SPILL: 3" Black iron outlet pipe. Corrosion caused a
hole to develop.

METHOD(S) USED TO CONTROL SPILL/RELEASE: 1. Lead plug dropped
in inlet of desc. pipe. 2. Compression clamp put around pipe
at leak. 3. Ag lime used to neutralize spillage.

DISPOSITION OF RECOVERED MATERIAL: Put in with R/P super storage
to be used back in process.

FATE OF NON-RECOVERED MATERIAL: _____

RECOVERY DATE: 4/24/96 RECOVERY TIME: 10:00 AM TIL 4:00 AM/PM

COMMENTS: When the leak was discovered we determined there was
140 tons acid in tank. After the leakage was controlled, the contents
were pumped into #1 Den Tank.

ATTACH THE FOLLOWING:

1. LIST ALL EMPLOYEES INVOLVED IN SPILL/RELEASE
2. LIST ALL EMPLOYEES INVOLVED IN RECOVERY
3. LIST ALL IMC RESPONSE CONTACTS, GIVE DATE & TIME
4. LIST ALL GOVERNMENT AGENCIES CONTACTED, DATE & TIME
(Indicate if a representative(s) was sent to the scene)
5. LIST ALL PRESS CONTACTS, TYPE OF CONTACT, DATE & TIME
6. A COPY OF ALL RELATED INJURY & PROPERTY DAMAGE REPORTS.

TOTAL ATTACHMENTS = _____

FOLLOWING EMPLOYEES INVOLVED IN CLEANUP.

MARK GAY

JERRY WILLIAMS

CLAY THOMPSON

DANNY PAYNE

JIMMY KELLEY

ALFREDO LORENZO

ELTON SMITH

ROBERT MARTIN

DOUGLAS SPRINGER

**THE SPILL WAS CONTAINED WITHIN THE DIKE, NO STATE OR FEDERAL AGENCY
WAS NOTIFIED.**

PA Scoresheets

Site Name: I.M.C. Agri Business Division ^{Rainbow} Investigator: Keevin M. Smith

CERCLIS ID No.: 6699 Agency/Organization: ADEM <sup>Land Division
Hazardous Waste Branch
Site Assessment Unit</sup>

Street Address: P.O. Box 158 (205) 764-7821
Commerce St. Florence, AL 35630 Street Address: 1751 Cong. W.L. Dickenson Drive
P.O. Box 301463

City/State/Zip: Florence, AL City/State/Zip: Montgomery, AL 36130-1463

Date: 9-12-97

INSTRUCTIONS FOR SCORESHEETS

Introduction

This scoresheets package functions as a self-contained workbook providing all of the basic tools to apply collected data and calculate a PA score. Note that a computerized scoring tool, "PA-Score," is also available from EPA (Office of Solid Waste and Emergency Response, Directive 9345.1-11). The scoresheets provide space to:

- Record information collected during the PA
- Indicate references to support information
- Select and assign values ("scores") for factors
- Calculate pathway scores
- Calculate the site score

Do not enter values or scores in shaded areas of the scoresheets. You are encouraged to write notes on the scoresheets and especially on the Criteria Lists. On scoresheets with a reference column, indicate a number corresponding to attached sources of information or pages containing rationale for hypotheses; attach to the scoresheets a numbered list of these references. Evaluate all four pathways. Complete all Criteria Lists, scoresheets, and tables. Show calculations, as appropriate. If scoresheets are photocopy reproduced, copy and submit the numbered pages (right-side pages) only.

GENERAL INFORMATION

Site Description and Operational History: Briefly describe the site and its operating history. Provide the site name, owner/operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note also if these activities are documented or alleged. Identify probable source types and prior spills. Summarize highlights of previous investigations.

Probable Substances of Concern: List hazardous substances that have or may have been stored, handled, or disposed at the site, based on your knowledge of site operations. Identify the sources to which the substances may be related. Summarize any existing analytical data concerning hazardous substances detected onsite, in releases from the site, or at targets.

GENERAL INFORMATION

Site Description and Operational History:

The IMC Agri Business Rainbow Division Site is located in Lauderdale County, in the town of Florence, Alabama—Township 3 South, Range 11 West; Section 13, North ½, Northwest ¼; at latitude 34° 47' 57.42" and longitude 87° 39' 18.11" More specifically, the site is approximately a 16 acre parcel of land

Lauderdale County has a temperate climate with abundant precipitation well distributed throughout all seasons. Statistically, Lauderdale County receives the most precipitation, 6.1 inches, during the month of February and the least precipitation, 2.0 inches, during the month of October. The normal annual total precipitation for Lauderdale County is 49.5 inches. Runoff in Lauderdale County is less than 26 inches per year and the mean annual lake evaporation is approximately 40 inches.

For Lauderdale County, the mean annual maximum temperature is approximately 97° F and the mean annual minimum temperature is approximately 9° F. On a monthly average, January is the coldest and July is the warmest. January has an average low temperature of 34° F and July has an average high temperature of 91° F.

The site is bounded on its northern side by Veterans Dr., to the east is Sweetwater Creek, to the south, the Florence Canal, and to west a small portion of woods. The western part, and a portion of the southern part of the facility is fenced, which makes the site practically inaccessible to the public. The only people that are likely to be exposed to any surficial contamination at the site are the workers that work daily at the site. Currently there are approximately 70 to 75 workers employed at the site.

I. M. C. Agri Business is involved in the production of fertilizer. Most all of the plant is floored in asphalt or concrete. All storage tanks are diked by a concrete barrier except for the anhydrous ammonia and propane tanks, both of these are a gas. All tanks are inspected once a year by ultra sound and found to be in satisfactory condition. I. M. C. Agri Business is one of the world's leading private enterprise producer and marketer of crop nutrients. The company has undergone a series of name changes since 1909, when the company was first established From International Agricultural Corp. to International Minerals and Chemicals Corp. ,Plant Food Division to International Fertilizer Ink, Rainbow Division to I. M. C. Agri Business, Rainbow Division which is a division of I. M. C. Global Operation Ink. However the sign at the Florence, Al. facility reads "I. M. C. Fertilizer Rainbow Division." The reason for this difference in identity is because the sign and the hiller building will be torn down due road construction in the near future. When the name changed management at the facility did not want to replace the sign twice.

International Agricultural Corporation (IAC) was formed June 14, 1909 by three men, Thomas C. Meadows, Oscar L. Dortch and Waldemar A. Schmidtman. The Florence, Al. facility was built between 1909 and 1910. The facility produced fertilizer by what is known as a batch process, by 1964 the process had changed to a granulation process and is still in use today. This plant produces about 140,000 tons of premium granular fertilizer annually. Also it claims the distinction of being the Corporation's oldest continuously operating production facility. Prior to its beginnings in 1909 as a fertilizer plant, the original building had been used as a flour mill as early as 1860.

Probable Substances of Concern (Previous investigations, analytical data)

Elevated nitrogen levels are found in the stormwater runoff. This is proven by the analytical data and records on file at I. M. C. Agri Business. There is definitely a release of surface water that is occurring at present at the site.

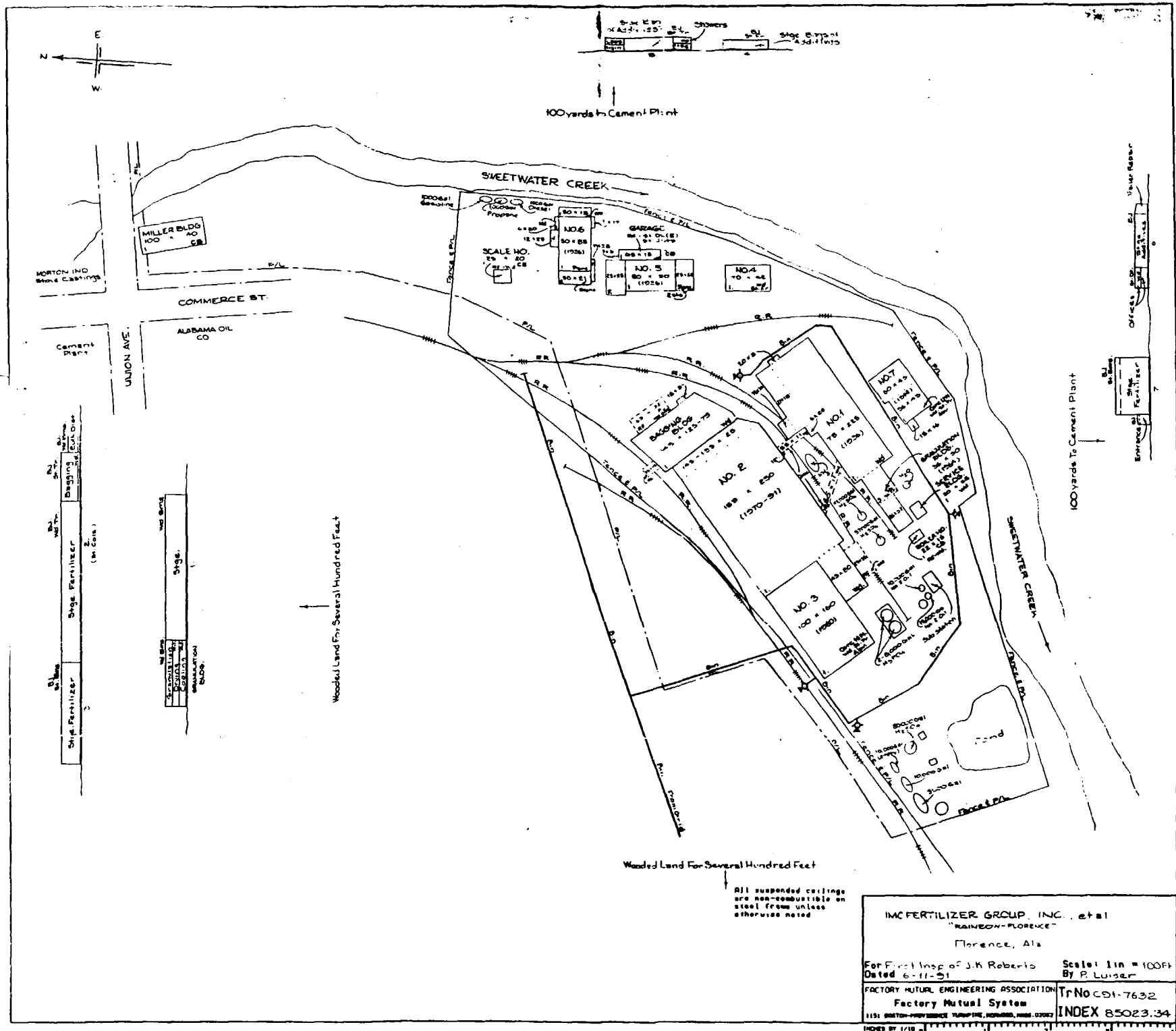
GENERAL INFORMATION

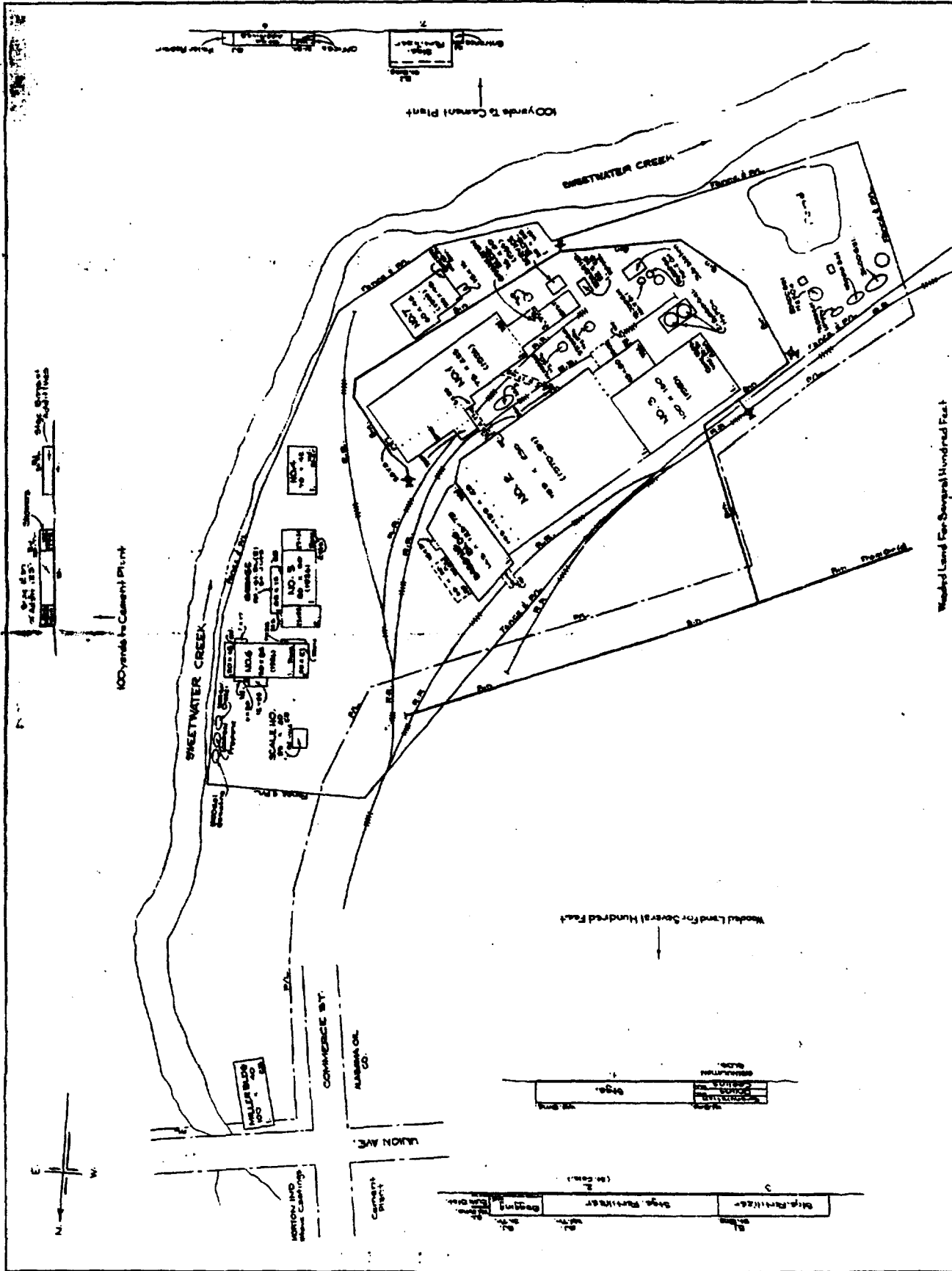
Site Description and Operational History:

Probable Substances of Concern:
(Previous investigations, analytical data)

GENERAL INFORMATION (continued)

Site Sketch: Prepare a sketch of the site (freehand is acceptable). Indicate all pertinent features of the site and nearby environs, including: waste sources, buildings, residences, access roads, parking areas, drainage patterns, water bodies, vegetation, wells, sensitive environments, etc.





MAC FERTILIZER GROUP, INC., et al
 Florence, Ala
 For First time of J.K. Roberts
 Dated 6-11-51
 Factory Mutual Engineering Association
 Factory Mutual System
 INDEX 85023.34

All suspended ceilings
 are removable as
 shown on the
 drawings noted

Washed Land For Several Hundred Feet

Washed Land For Several Hundred Feet

100 yards to Cement Plant

100 yards to Cement Plant

GENERAL INFORMATION (continued)

Site Sketch:

(Show all pertinent features, indicate sources and closest targets, indicate north)

SOURCE EVALUATION

- Number and name each source (e.g., 1. East Drum Storage Area, 2. Sludge Lagoon, 3. Battery Pile).
- Identify source type according to the list below.
- Describe the physical character of each source (e.g., dimensions, contents, waste types, containment, operating history).
- Show waste quantity (WQ) calculations for each source for appropriate tiers. Refer to instructions opposite page 5 and PA Tables 1a and 1b. Identify waste quantity tier and waste characteristics (WC) factor category score (for a site with a single source, according to PA Table 1a). Determine WC from PA Table 1b for the sum of source WQs for a multiple-source site.
- Attach additional sheets if necessary.
- Determine the site WC factor category score and record at the bottom of the page.

Source Type Descriptions

Landfill: an engineered (by excavation or construction) or natural hole in the ground into which wastes have been disposed by backfilling, or by contemporaneous soil deposition with waste disposal, covering wastes from view.

Surface Impoundment: a topographic depression, excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold accumulated liquid wastes, wastes containing free liquids, or sludges that were not backfilled or otherwise covered during periods of deposition; depression may be dry if deposited liquid has evaporated, volatilized or leached, or wet with exposed liquid; structures that may be more specifically described as lagoon pond, aeration pit, settling pond, tailings pond, sludge pit, etc.; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drums: portable containers designed to hold a standard 55-gallon volume of wastes.

Tanks and Non-Drum Containers: any stationary device, designed to contain accumulated wastes, constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic) that provide structural support; any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: soil onto which available evidence indicates that a hazardous substance was spilled, spread, disposed, or deposited.

Pile: any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of piles are: **Chemical Waste Pile** – consists primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks; **Scrap Metal or Junk Pile** – consists primarily of scrap metal or discarded durable goods such as appliances, automobiles, auto parts, or batteries, composed of materials suspected to contain or have contained a hazardous substance; **Tailings Pile** – consists primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation; **Trash Pile** – consists primarily of paper, garbage, or discarded non-durable goods which are suspected to contain or have contained a hazardous substance.

Land Treatment: landfarming or other land treatment method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: a source that does not fit any of the descriptions above; examples include contaminated building, ground water plume with no identifiable source, storm drain, dry well, and injection well.

SOURCE EVALUATION

Source No.: <u>1</u>	Source Name: <u>Drums</u>	Source Waste Quantity (WQ) Calculations: <u>Volume</u> $9 \div 10 = \textcircled{.9}$
Source Description: <u>Drums</u>		

Source No.: <u>2</u>	Source Name: <u>Fertilizer</u>	Source Waste Quantity (WQ) Calculations: <u>Volume</u> $100 \text{ Ft.} \times 100 \text{ Ft.} \times 20 \text{ Ft.} = 200,000 \div 67.5 = \textcircled{2963}$
Source Description: <u>Pile Approx. 100Ft X 100Ft X 20Ft</u>		<u>Area</u> $100 \text{ Ft.} \times 100 \text{ Ft.} = 10,000 \div 13 = \textcircled{769}$

Source No.: <u> </u>	Source Name: <u>Lagoon</u>	Source Waste Quantity (WQ) Calculations: <u>Volume</u> $109 \text{ Ft.} \times 109 \text{ Ft.} \times 10 \text{ Ft.} = 118,810 \div 67.5 = \textcircled{1760.15}$
Source Description: <u>Surface impoundment</u>		<u>Area</u> $9324 \div 13 = \textcircled{717.23}$ See storm water Flow Estimation Sheet

Site WC:

32

SOURCE EVALUATION

10/20/01

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Site WC:

WASTE CHARACTERISTICS (WC) SCORES

WC, based on waste quantity, may be determined by one or all of four measures called "tiers": constituent quantity, wastestream quantity, source volume, and source area. PA Table 1a (page 5) is divided into these four tiers. The amount and detail of information available determine which tier(s) to use for each source. For each source, evaluate waste quantity by as many of the tiers as you have information to support, and select the result that gives you the highest WC score. If minimal, incomplete, or no information is available regarding waste quantity, assign a WC score of 18 (minimum).

PA Table 1a has 6 columns: column 1 indicates the quantity tier; column 2 lists source types for the four tiers; columns 3, 4, and 5 provide ranges of waste amount for sites with only one source, which correspond to WC scores at the top of the columns (18, 32, or 100); column 6 provides formulas to obtain source waste quantity (WQ) values at sites with multiple sources.

To determine WC for sites with only one source:

1. *Identify source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available.*
3. *Estimate the mass and/or dimensions of the source.*
4. *Determine which quantity tiers to use based on available source information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for the source.*
6. *Identify the range into which the total quantity falls for each tier evaluated (PA Table 1a).*
7. *Determine the highest WC score obtained for any tier (18, 32, or 100, at top of PA Table 1a columns 3, 4, and 5, respectively).*
8. *Use this WC score for all pathways.**

To determine WC for sites with multiple sources:

1. *Identify each source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available for each source.*
3. *Estimate the mass and/or dimensions of each source.*
4. *Determine which quantity tiers to use for each source based on the available information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for each source.*
6. *For each source, use the formulas in column 6 of PA Table 1a to determine the WQ value for each tier that can be evaluated. The highest WQ value obtained for any tier is the WQ value for the source.*
7. *Sum the WQ values for all sources to get the site WQ total.*
8. *Use the site WQ total from step 7 to assign the WC score from PA Table 1b.*
9. *Use this WC score for all pathways.**

* The WC score is considered in all four pathways. However, if a primary target is identified for the ground water, surface water, or air migration pathway, assign the determined WC or a score of 32, whichever is greater, as the WC score for that pathway.

PA TABLE 1: WASTE CHARACTERISTICS (WC) SCORES

PA Table 1a: WC Scores for Single Source Sites and Formulas for Multiple Source Sites

TIER	SOURCE TYPE	SINGLE SOURCE SITES (assigned WC scores)			MULTIPLE SOURCE SITES
		WC = 18	WC = 32	WC = 100	
Correctly Closed	N/A	≤ 100 lb	> 100 to 10,000 lb	$> 10,000$ lb	$D + 1$
Permanently Closed	N/A	$\leq 600,000$ lb	$> 600,000$ to 60 million lb	> 60 million lb	$D + 5,000$
VOLUME	Landfill	≤ 6.75 million ft^3 $\leq 250,000$ yd^3	> 6.75 million to 675 million ft^3 $> 250,000$ to 25 million yd^3	> 675 million ft^3 > 25 million yd^3	$\text{ft}^3 + 67,500$ $\text{yd}^3 + 2,500$
	Surface impoundment	$\leq 6,750$ ft^3 ≤ 250 yd^3	$> 6,750$ to 675,000 ft^3 > 250 to 25,000 yd^3	$> 675,000$ ft^3 $> 25,000$ yd^3	$\text{ft}^3 + 67.5$ $\text{yd}^3 + 2.5$
	Drums	$\leq 1,000$ drums	$> 1,000$ to 100,000 drums	$> 100,000$ drums	$\text{drums} + 10$
	Tanks and non-drum containers	$\leq 50,000$ gallons	$> 50,000$ to 5 million gallons	> 5 million gallons	$\text{gallons} + 500$
	Contaminated soil	≤ 6.75 million ft^3 $\leq 250,000$ yd^3	> 6.75 million to 675 million ft^3 $> 250,000$ to 25 million yd^3	> 675 million ft^3 > 25 million yd^3	$\text{ft}^3 + 67,500$ $\text{yd}^3 + 2,500$
	Pile	$\leq 6,750$ ft^3 ≤ 250 yd^3	$> 6,750$ to 675,000 ft^3 > 250 to 25,000 yd^3	$> 675,000$ ft^3 $> 25,000$ yd^3	$\text{ft}^3 + 67.5$ $\text{yd}^3 + 2.5$
	Other	$\leq 6,750$ ft^3 ≤ 250 yd^3	$> 6,750$ to 675,000 ft^3 > 250 to 25,000 yd^3	$> 675,000$ ft^3 $> 25,000$ yd^3	$\text{ft}^3 + 67.5$ $\text{yd}^3 + 2.5$
AREA	Landfill	$\leq 340,000$ ft^2 ≤ 7.8 acres	$> 340,000$ to 34 million ft^2 > 7.8 to 780 acres	> 34 million ft^2 > 780 acres	$\text{ft}^2 + 3,400$ $\text{acres} + 0.078$
	Surface impoundment	$\leq 1,300$ ft^2 ≤ 0.029 acres	$> 1,300$ to 130,000 ft^2 > 0.029 to 2.9 acres	$> 130,000$ ft^2 > 2.9 acres	$\text{ft}^2 + 13$ $\text{acres} + 0.00029$
	Contaminated soil	≤ 3.4 million ft^2 ≤ 78 acres	> 3.4 million to 340 million ft^2 > 78 to 7,800 acres	> 340 million ft^2 $> 7,800$ acres	$\text{ft}^2 + 34,000$ $\text{acres} + 0.78$
	Pile*	$\leq 1,300$ ft^2 ≤ 0.029 acres	$> 1,300$ to 130,000 ft^2 > 0.029 to 2.9 acres	$> 130,000$ ft^2 > 2.9 acres	$\text{ft}^2 + 13$ $\text{acres} + 0.00029$
	Land treatment	$\leq 27,000$ ft^2 ≤ 0.62 acres	$> 27,000$ to 2.7 million ft^2 > 0.62 to 62 acres	> 2.7 million ft^2 > 62 acres	$\text{ft}^2 + 270$ $\text{acres} + 0.0062$

1 ton = 2,000 lb = 1 yd^3 = 4 drums = 200 gallons

* Use area of land surface under pile, not surface area of pile.

PA Table 1b: WC Scores for Multiple Source Sites

WQ Total	WC Score
> 0 to 100	18
> 100 to 10,000	32
$> 10,000$	100

GROUND WATER PATHWAY

Ground Water Use Description: Provide information on ground water use in the vicinity. Present the general stratigraphy, aquifers used, and distribution of private and municipal wells.

Calculations for Drinking Water Populations Served by Ground Water: Provide populations from private wells and municipal supply systems in each distance category. Show apportionment calculations for blended supply systems.

**GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION**

Describe Ground Water Use Within 4-miles of the Site:
(Describe stratigraphy, information on aquifers, municipal and/or private wells)

Calculations for Drinking Water Populations Served by Ground Water:

GROUND WATER PATHWAY GROUND WATER USE DESCRIPTION

Describe Ground Water Use Within 4-Miles of the Site

(Describe stratigraphy, information of aquifers, municipal and/or private wells)

Lauderdale County is in the Highland Rim section of the Interior Low Plateau physiographic province. The Highland Rim section is characterized by alternating landscape of stream valleys and gently rolling hills of slight to moderate relief. The IMC Agri Business site, as well as most of the study area, is underlain by a sequence of carbonate rocks of Mississippian age. The youngest of the carbonate rock units is the Tuscumbia Limestone and the oldest is the Fort Payne Chert. These geologic units dip to the south and southwest at a rate of about 30 feet per mile.

The Fort Payne Chert includes all rock between the Chattanooga Shale and the Tuscumbia Limestone. The Fort Payne Chert is a thin-bedded microcrystalline siliceous limestone unit. The average thickness of the Fort Payne Chert is about 150 feet. Many solution features are present in the Fort Payne.

The Tuscumbia Limestone formation is also known as the St. Lewis or Huntsville Limestone. The general lithology of the Tuscumbia Limestone is a light-gray micritic or bioclastic limestone with white chert nodules. Dark gray chert is found within the unit but is less common. The average thickness of the Tuscumbia is about 200 feet.

All the public water supplies in Lauderdale County and Colbert County that utilize ground water get their ground water from the Tuscumbia-Fort Payne aquifer. The Tuscumbia-Fort Payne aquifer can be considered a partially confined aquifer. The underlying Chattanooga Shale makes the Tuscumbia-Fort Payne aquifer practically impermeable from below, and the presence of a low hydraulic conductivity residual mantle that overlies much of the study area decreases the likelihood of surface contamination entering into the aquifer from above. The Tuscumbia-Fort Payne aquifer is highly susceptible to surface contamination in areas where poorly drained land surfaces reside above the potentiometric surface of the aquifer. The Tuscumbia-Fort Payne aquifer is extremely susceptible to surface contamination in areas where dissolution processes have formed karst surface features such as sinkholes and disappearing streams.

There are no known public or private drinking water wells located within the 4-mile target radius. Since no drinking water wells have been identified in the area, the only targets of the ground water pathway are those that fall into the resources category.

Due to the great amount of years that industry has been present in the community of Sweetwater, it is somewhat likely that the ground water in this community has become contaminated by metals, volatiles, and semi-volatiles. No drinking water wells have been identified in the area and therefore, no primary or secondary targets exist that could be exposed to the suspected contamination of the groundwater in the Sweetwater area.

Calculations for Drinking Water Populations Served by Ground Water:

There are currently no drinking water populations served by ground water within 4-miles of the site.

GROUND WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to evaluate conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the well that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

GROUND WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE	PRIMARY TARGETS
<p>Y N U e o n s k</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Are sources poorly contained?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is waste quantity particularly large?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is precipitation heavy?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the infiltration rate high?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the site located in an area of karst terrain?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the subsurface highly permeable or conductive?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is drinking water drawn from a shallow aquifer?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Are suspected contaminants highly mobile in ground water?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Does analytical or circumstantial evidence suggest ground water contamination?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Other criteria? _____</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> SUSPECTED RELEASE?</p>	<p>Y N U e o n s k</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is any drinking water well nearby?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Has any nearby drinking water well been closed?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Has any nearby drinking water user reported foul-tasting or foul-smelling water?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Does any nearby well have a large drawdown or high production rate?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Does analytical or circumstantial evidence suggest contamination at a drinking water well?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Does any drinking water well warrant sampling?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Other criteria? _____</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> PRIMARY TARGET(S) IDENTIFIED?</p>
<p>Summarize the rationale for Suspected Release (attach an additional page if necessary):</p> <p>No suspected release</p>	<p>Summarize the rationale for Primary Targets (attach an additional page if necessary):</p> <p>No primary targets</p>

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Ground Water Pathway Criteria List (page 7) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to ground water. Record depth to aquifer (in feet): the difference between the deepest occurrence of a hazardous substance and the depth of the top of the shallowest aquifer at (or as near as possible) to the site. Note whether the site is in karst terrain (characterized by abrupt ridges, sink holes, caverns, springs, disappearing streams). Record the distance (in feet) from any source to the nearest well used for drinking water.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Ground Water Pathway Criteria List (page 7). If you suspect a release to ground water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on depth to aquifer or whether the site is in an area of karst terrain. If you do not suspect a release to ground water, use only Column B to score this pathway.

Targets (T)

This factor category evaluates the threat to populations obtaining drinking water from ground water. To apportion populations served by blended drinking water supply systems, determine the percentage of population served by each well based on its production.

3. **Primary Target Population:** Evaluate populations served by all drinking water wells that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Ground Water Pathway Criteria List (page 7) to make this determination. In the space provided, enter the population served by any wells you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations served by all drinking water wells within 4 miles that you do not suspect have been exposed to a hazardous substance. Use PA Table 2a or 2b (for wells drawing from non-karst and karst aquifers, respectively) (page 9). If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each distance category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Well** represents the threat posed to the drinking water well that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 2a or 2b for the closest distance category with a drinking water well population.

6. **Wellhead Protection Area (WHPA):** WHPAs are special areas designated by States for protection under Section 1428 of the Safe Drinking Water Act. Local/State and EPA Regional water officials can provide information regarding the location of WHPAs.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if ground water within 4 miles has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

8. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for ground water, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Ground Water Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Is the site located in karst terrain?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Depth to aquifer:	30 ft
Distance to the nearest drinking water well:	None in the area

LIKELIHOOD OF RELEASE

	A Suspected Release	B No Suspected Release	Reference
1. SUSPECTED RELEASE: If you suspect a release to ground water (see page 7), assign a score of 550. Use only column A for this pathway.			
2. NO SUSPECTED RELEASE: If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.		500	
LR =		500	

TARGETS

3. PRIMARY TARGET POPULATION: Determine the number of people served by drinking water wells that you suspect have been exposed to a hazardous substance from the site (see Ground Water Pathway Criteria List, page 7). _____ people x 10 =			
4. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water wells that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 2. Are any wells part of a blended system? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, attach a page to show apportionment calculations.		0	
5. NEAREST WELL: If you have identified a primary target population for ground water, assign a score of 50; otherwise, assign the Nearest Well score from PA Table 2. If no drinking water wells exist within 4 miles, assign a score of zero.		0	
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA, or if you have identified any primary target well within a WHPA, assign a score of 20; assign 5 if neither condition holds but a WHPA is present within 4 miles; otherwise assign zero.		0	
7. RESOURCES		5	
T =		5	

WASTE CHARACTERISTICS

8. A. If you have identified any primary target for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.			
B. If you have NOT identified any primary target for ground water, assign the waste characteristics score calculated on page 4.		32	
WC =		32	

GROUND WATER PATHWAY SCORE:

$$\frac{LR \times T \times WC}{82,500}$$

Result to a maximum of 1001
.9697

$$\frac{500 \times 5 \times 32}{82,500} = .9697$$

PA TABLE 2: VALUES FOR SECONDARY GROUND WATER TARGET POPULATIONS

PA Table 2a: Non-Kerst Aquifers

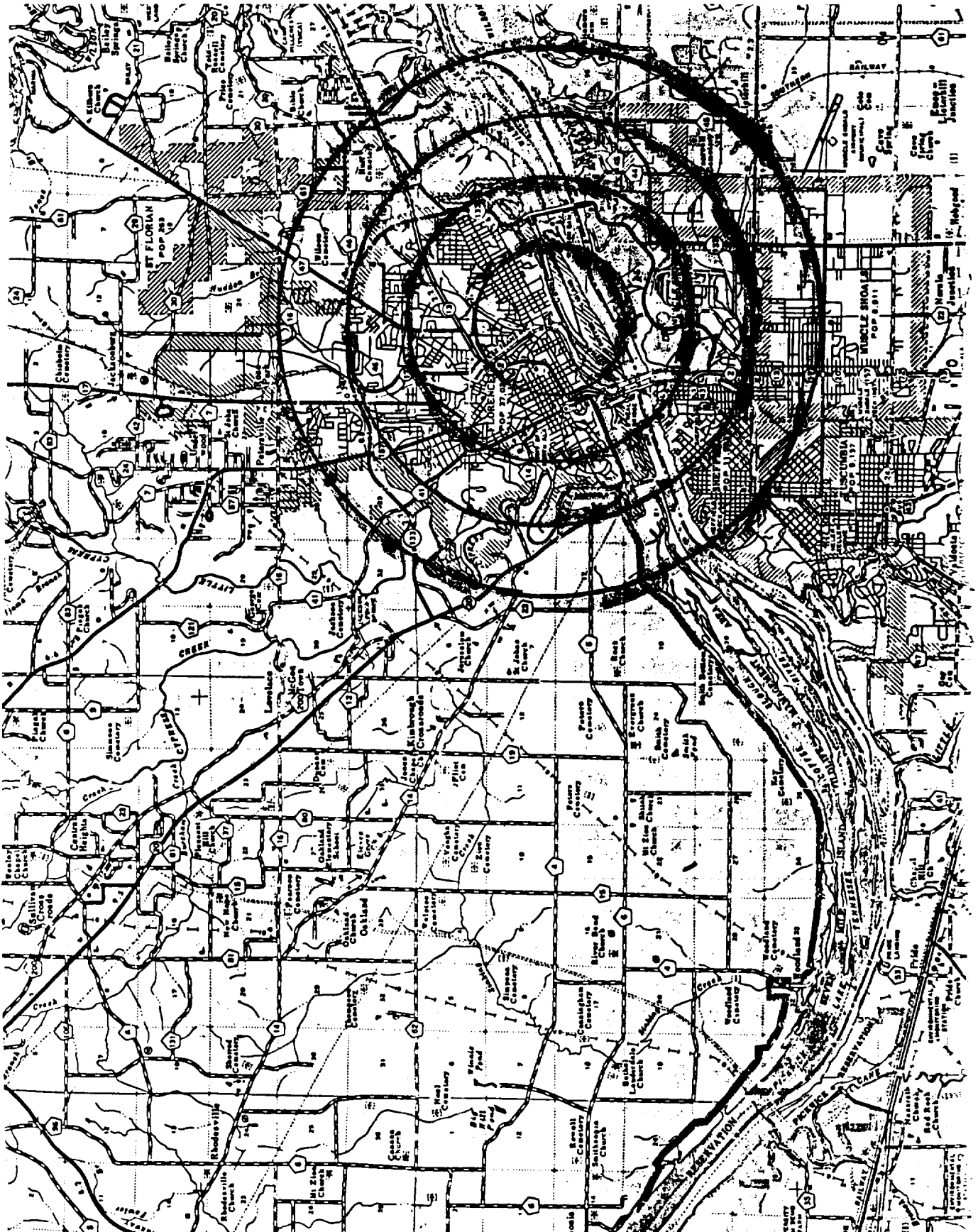
Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to 1/4 mile	_____	20	1	2	5	10	52	163	521	1,633	5,214	16,325	_____
> 1/4 to 1/2 mile	_____	18	1	1	3	10	32	101	323	1,012	3,233	10,121	_____
> 1/2 to 1 mile	_____	9	1	1	2	5	17	52	167	522	1,668	5,224	_____
> 1 to 2 miles	_____	5	1	1	1	3	9	29	94	294	939	2,938	_____
> 2 to 3 miles	_____	3	1	1	1	2	7	21	68	212	678	2,122	_____
> 3 to 4 miles	_____	2	1	1	1	1	4	13	42	131	417	1,308	_____
Nearest Well -		_____	Score -										_____

PA Table 2b: Kerst Aquifers

Distance from Site	Population	Nearest Well (use 20 for kerst)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to 1/4 mile	_____	20	1	2	5	10	52	163	521	1,633	5,214	16,325	_____
> 1/4 to 1/2 mile	_____	20	1	1	3	10	32	101	323	1,012	3,233	10,121	_____
> 1/2 to 1 mile	_____	20	1	1	3	8	26	82	261	816	2,607	8,162	_____
> 1 to 2 miles	_____	20	1	1	3	8	26	82	261	816	2,607	8,162	_____
> 2 to 3 miles	_____	20	1	1	3	8	26	82	261	816	2,607	8,162	_____
> 3 to 4 miles	_____	20	1	1	3	8	26	82	261	816	2,607	8,162	_____
Nearest Well -		_____	Score -										_____

SURFACE WATER PATHWAY

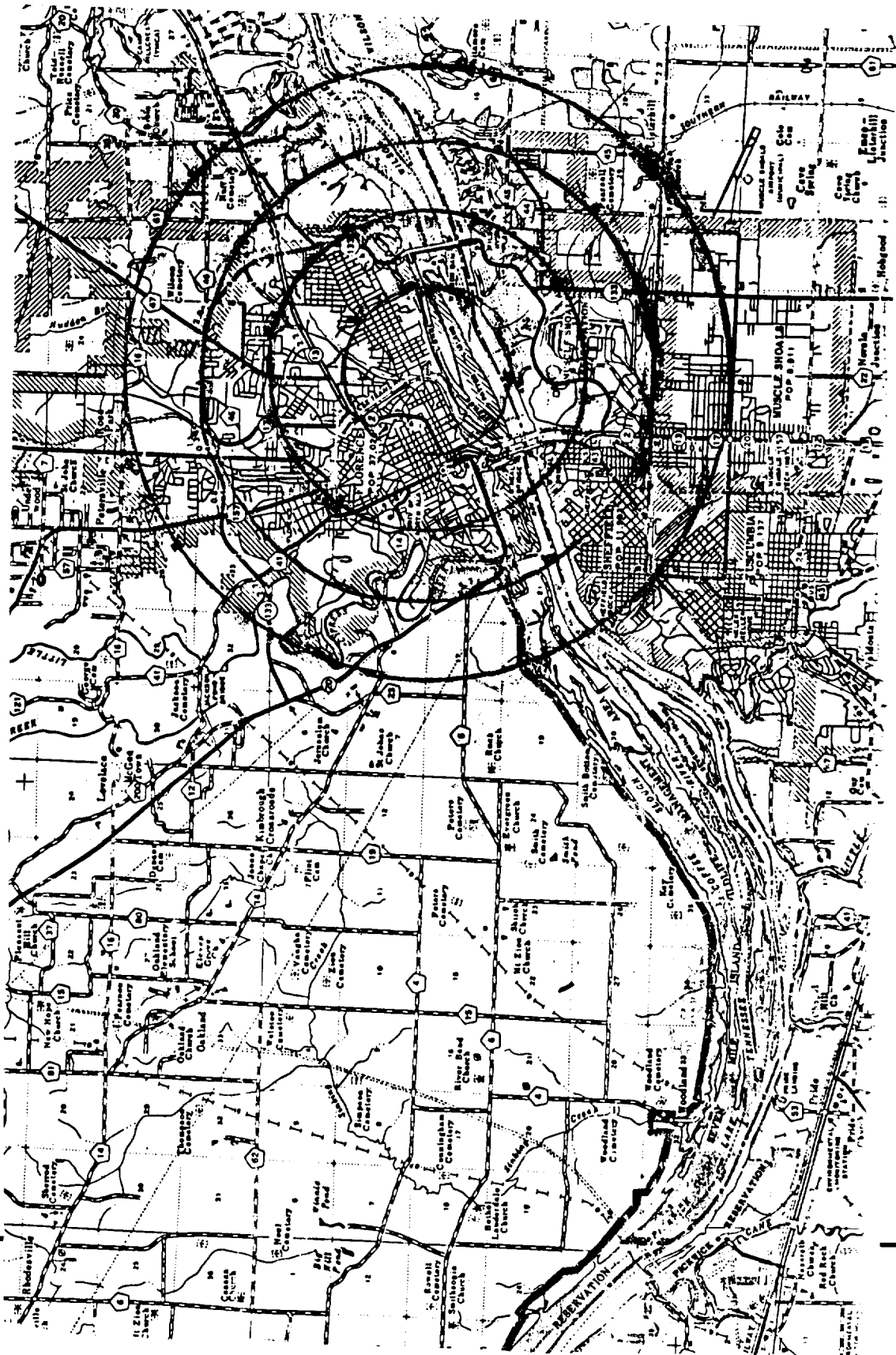
Migration Route Sketch: Sketch the surface water migration pathway (freehand is acceptable) illustrating the drainage route and identifying water bodies, probable point of entry, flows, and targets.



SURFACE WATER PATHWAY MIGRATION ROUTE SKETCH

Surface Water Migration Route Sketch:

(include runoff routes, probable point of entry, 15-mile target distance limit, intakes, fisheries, and sensitive environments)



SURFACE WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to guide you through evaluation of some conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the target that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

If the distance to surface water is greater than 2 miles, do not evaluate the surface water migration pathway. Document the source of information in the text boxes below the surface water criteria list.

SURFACE WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Y N U
e o n
s / k

- ☒ ☐ ☐ Is surface water nearby?
- ☒ ☐ ☐ Is waste quantity particularly large?
- ☒ ☐ ☐ Is the drainage area large?
- ☒ ☐ ☐ Is rainfall heavy?
- ☐ ☒ ☐ Is the infiltration rate low?
- ☐ ☒ ☐ Are sources poorly contained or prone to runoff or flooding?
- ☒ ☐ ☐ Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
- ☐ ☒ ☐ Is vegetation stressed along the probable runoff route?
- ☐ ☒ ☐ Are sediments or water unnaturally discolored?
- ☐ ☐ ☒ Is wildlife unnaturally absent?
- ☐ ☒ ☐ Has deposition of waste into surface water been observed?
- ☐ ☐ ☒ Is ground water discharge to surface water likely?
- ☒ ☐ ☐ Does analytical or circumstantial evidence suggest surface water contamination?
- ☐ ☐ ☐ Other criteria? _____
- ☐ ☒ ☐ **SUSPECTED RELEASE?**

PRIMARY TARGETS

Y N U
e o n
s / k

- ☒ ☐ ☐ Is any target nearby? If yes:
 - ☐ Drinking water intake
 - ☒ Fishery
 - ☐ Sensitive environment
- ☐ ☒ ☐ Has any intake, fishery, or recreational area been closed?
- ☒ ☐ ☐ Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target?
- ☐ ☐ ☒ Does any target warrant sampling? If yes:
 - ☐ Drinking water intake
 - ☒ Fishery
 - ☒ Sensitive environment
- ☐ ☐ ☐ Other criteria? _____
- ☐ ☒ ☐ **PRIMARY INTAKE(S) IDENTIFIED?**
- ☒ ☐ ☐ **PRIMARY FISHERY(IES) IDENTIFIED?**
- ☒ ☐ ☐ **PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

Due to the analytical data for storm water runoff, there is reason to suspect a release.

Summarize the rationale for Primary Targets (attach an additional page if necessary):

Sweetwater Creek and Tn. River are both fisheries, and sensitive environments. The Tn. River is used for swimming, fishing and boating.

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics

The surface water pathway includes three threats: Drinking Water Threat, Human Food Chain Threat, and Environmental Threat. Answer the questions at the top of the page. Refer to the Surface Water Pathway Criteria List (page 11) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to surface water. Record the distance to surface water (the shortest overland drainage distance from a source to a surface water body). Record the flood frequency at the site (e.g., 100-yr, 200-yr). If the site is located in more than one floodplain, use the most frequent flooding event. Identify surface water use(s) along the surface water migration path and their distance(s) from the site.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Surface Water Pathway Criteria List (page 11). If you suspect a release to surface water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on the shortest overland drainage distance from a source to a surface water body. If distance to surface water is 2,500 feet or less, assign a score of 500. If distance to surface water is greater than 2,500 feet, determine score based on flood frequency. If you do not suspect a release to surface water, use only Column B to score this pathway.

Drinking Water Threat Targets (T)

3. List all drinking water intakes on downstream surface water bodies along the surface water migration path. Record the intake name, the type of water body on which the intake is located, the flow of the water body, and the number of people served by the intake (apportion the population if part of a blended system).

4. **Primary Target Population:** Evaluate populations served by all drinking water intakes that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. In the space provided, enter the population served by all intakes you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply by 10 to determine the Primary Target Population score. Remember, if you do not suspect a release, there can be no primary target population.

5. **Secondary Target Population:** Evaluate populations served by all drinking water intakes within the target distance limit that you do not suspect have been exposed to a hazardous substance. Use PA Table 3 (page 13) and enter the population served by intakes for each flow category. If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each flow category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

Gauging station data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that the flow category "mixing zone of quiet flowing rivers" is limited to 3 miles from the probable point of entry.

6. **Nearest Intake** represents the threat posed to the drinking water intake that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 3 (page 13) for the lowest-flowing water body on which there is an intake.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if surface water within the target distance limit has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Surface Water Pathway Criteria List, page 11)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Distance to surface water:	10 ft
Flood frequency:	100 yrs
What is the downstream distance to the nearest drinking water intake? <u>3 1/2</u> miles	
Nearest fishery? <u>10 ft</u> miles	Nearest sensitive environment? <u>0</u> miles

LIKELIHOOD OF RELEASE

1. **SUSPECTED RELEASE:** If you suspect a release to surface water (see page 11), assign a score of 550. Use only column A for this pathway.
2. **NO SUSPECTED RELEASE:** If you do not suspect a release to surface water, use the table below to assign a score based on distance to surface water and flood frequency. Use only column B for this pathway.

Distance to surface water < 2,500 feet	500
Distance to surface water > 2,500 feet, and	
Site in annual or 10-year floodplain	500
Site in 100-year floodplain	400
Site in 500-year floodplain	300
Site outside 500-year floodplain	100

A Suspected Release	B No Suspected Release
550	(MAXIMUM OF 100)
550	(MAXIMUM OF 100)

LR = 550

DRINKING WATER THREAT TARGETS

3. Record the water body type, flow (if applicable), and number of people served by each drinking water intake within the target distance limit. If there is no drinking water intake within the target distance limit, factors 4, 5, and 6 each receive zero scores.

Intake Name	Water Body Type	Flow	People Served
Sheffield Utility	River	3,170 cfs	48,260
Raw water intake		_____ cfs	_____
		_____ cfs	_____

4. **PRIMARY TARGET POPULATION:** If you suspect any drinking water intake listed above has been exposed to a hazardous substance from the site (see Surface Water Pathway Criteria List, page 11), list the intake name(s) and calculate the factor score based on the total population served.

None

_____ people x 10 =

5. **SECONDARY TARGET POPULATION:** Determine the number of people served by drinking water intakes that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 3.

Are any intakes part of a blended system? Yes ☐ No ☒
If yes, attach a page to show apportionment calculations.

6. **NEAREST INTAKE:** If you have identified a primary target population for the drinking water threat (factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking water intake exists within the target distance limit, assign a score of zero.

7. **RESOURCES**

	0
	5
	0
	5
	10

T = 10

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow (see PA Table 4)	Population	Nearest Intake (choose highest)	Population Served by Intakes Within Flow Category											Population Value
			1 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	
< 10 cfs	_____	20	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,248	_____
10 to 100 cfs	_____	2	1	1	2	5	16	52	163	521	1,633	5,214	16,325	_____
> 100 to 1,000 cfs	_____	1	0	0	1	1	2	5	16	52	163	521	1,633	_____
> 1,000 to 10,000 cfs	<u>48,260</u>	0	0	0	0	0	1	1	2	5	16	52	163	<u>5</u>
> 10,000 cfs or Great Lakes	_____	0	0	0	0	0	0	0	1	1	2	5	16	_____
3-mile Mixing Zone	_____	10	1	3	8	26	82	261	816	2,607	8,162	26,068	81,663	_____
Nearest Intake =		<u>0</u>												Score = <u>5</u>

**PA TABLE 4: SURFACE WATER TYPE / FLOW CHARACTERISTICS
WITH DILUTION WEIGHTS FOR SECONDARY SURFACE WATER SENSITIVE ENVIRONMENTS**

Type of Surface Water Body		Dilution Weight
Water Body Type	Flow	
minimal stream	< 10 cfs	1
small to moderate stream	10 to 100 cfs	0.1
moderate to large stream	> 100 to 1,000 cfs	N/A
large stream to river	> 1,000 to 10,000 cfs	N/A
large river	> 10,000 cfs	N/A
3-mile mixing zone of quiet flowing streams or rivers	10 cfs or greater	N/A
coastal tidal water (harbors, sounds, bays, etc.), ocean, or Great Lakes	N/A	N/A

SURFACE WATER PATHWAY HUMAN FOOD CHAIN THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Human Food Chain Threat Targets (T)

8. The only human food chain targets are fisheries. A fishery is an area of a surface water body from which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. Food chain organisms include fish, shellfish, crustaceans, amphibians, and amphibious reptiles. Fisheries are delineated by changes in surface water body type (i.e., streams and rivers, lakes, coastal tidal waters, and oceans/Great Lakes) and whenever the flow characteristics of a stream or river change.

In the space provided, identify all fisheries within the target distance limit. Indicate the surface water body type and flow for each fishery. Gauging station flow data are available for many surface water bodies from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that, if there are no fisheries within the target distance limit, the Human Food Chain Threat Targets score is zero.

9. Primary fisheries are any fisheries within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary fisheries, list them in the space provided, enter 300 as the Primary Fisheries factor score, and do not evaluate Secondary Fisheries. Note that if you do not suspect a release, there can be no primary fisheries.

10. Secondary fisheries are fisheries that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if fisheries are present within the target distance limit, but none is considered a primary fishery.

- A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.
- B. If you do not suspect a release, evaluate this factor based on flow. In the absence of gauging station flow data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). Assign a Secondary Fisheries score from the table on the scoresheet using the lowest flow at any fishery within the target distance limit. (Dilution weight multiplier does not apply to PA evaluation of this factor.)

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

**SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT SCORESHEET**

LIKELIHOOD OF RELEASE

Enter Surface Water Likelihood of Release score from page 12.

LR =

A	B
Suspected Release 200	No Suspected Release 100,000,000 = 100
550	

Reference

HUMAN FOOD CHAIN THREAT TARGETS

8. Record the water body type and flow (if applicable) for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Fishery Name	Water Body Type	Flow
Sweetwater Creek	minimal stream	<10 cfs
	Lg. River	1000-10000 cfs
		cfs
		cfs
		cfs

9. PRIMARY FISHERIES: If you suspect any fishery listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the primary fisheries:

Sweetwater Creek
In. River

10. SECONDARY FISHERIES

- A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.
- B. If you do not suspect a release, assign a Secondary Fisheries score from the table below using the lowest flow at any fishery within the target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

300

T =

300	
-----	--

SURFACE WATER PATHWAY ENVIRONMENTAL THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Environmental Threat Targets (T)

11. PA Table 5 (page 16) lists sensitive environments for the Surface Water Pathway Environmental Threat. In the space provided, identify all sensitive environments located within the target distance limit. Indicate the surface water body type and flow at each sensitive environment. Gauging station flow data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that if there are no sensitive environments within the target distance limit, the Environmental Threat Targets score is zero.

12. Primary sensitive environments are surface water sensitive environments within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary sensitive environments, list them in the space provided, enter 300 as the Primary Sensitive Environments factor score, and do not evaluate Secondary Sensitive Environments. Note that if you do not suspect a release, there can be no primary sensitive environments.

13. Secondary sensitive environments are surface water sensitive environments that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if surface water sensitive environments are present within the target distance limit, but none is considered a primary sensitive environment. Evaluate secondary sensitive environments based on flow.

- In the table provided, list all secondary sensitive environments on surface water bodies with flow of 100 cfs or less.
 - 1) Use PA Table 4 (page 13) to determine the appropriate dilution weight for each.
 - 2) Use PA Tables 5 and 6 (page 16) to determine the appropriate value for each sensitive environment type and for wetlands frontage.
 - 3) For a sensitive environment that falls into more than one of the categories in PA Table 5, sum the values for each type to determine the environment value (e.g., a wetland with 1.5 miles frontage (value of 50) that is also a critical habitat for a Federally designated endangered species (value of 100) would receive a total value of 150).
 - 4) For each sensitive environment, multiply the dilution weight by the environment type (or length of wetlands) value and record the product in the far-right column.
 - 5) Sum the values in the far-right column and enter the total as the Secondary Sensitive Environments score. Do not evaluate part B of this factor.
- If all secondary sensitive environments are on surface water bodies with flows greater than 100 cfs assign 10 as the Secondary Sensitive Environments score.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

2000

References

UR -

T-

300

300

PA TABLE 5: SURFACE WATER AND AIR PATHWAY SENSITIVE ENVIRONMENTS VALUES

<i>Sensitive Environment</i>	<i>Assigned Value</i>
Critical habitat for Federally designated endangered or threatened species Menne Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federally designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species in a river system Terrestrial areas utilized for breeding by large or dense aggregations of vertebrate animals (air pathway) or semi-aquatic foragers (surface water pathway) National river reach designated as Recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities State designated areas for protection/maintenance of aquatic life under the Clean Water Act	25
Wetlands	5
See PA Table 6 (Surface Water Pathway) or PA Table 9 (Air Pathway)	

**PA TABLE 6: SURFACE WATER PATHWAY
WETLANDS FRONTAGE VALUES**

<i>Total Length of Wetlands</i>	<i>Assigned Value</i>
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORES

Waste Characteristics (WC)

14. **Waste Characteristics:** Score is assigned from page 4. However, if a primary target has been identified for any surface water threat, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Surface Water Pathway Threat Scores

Fill in the matrix with the appropriate scores from the previous pages. To calculate the score for each threat: multiply the scores for LR, T, and WC; divide the product by 82,500; and round the result to the nearest integer. The Drinking Water Threat and Human Food Chain Threat are each subject to a maximum of 100. The Environmental Threat is subject to a maximum of 60. Enter the rounded threat scores in the far-right column.

Surface Water Pathway Score

Sum the individual threat scores to determine the Surface Water Pathway Score. If the sum is greater than 100, assign 100.

**SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY**

WASTE CHARACTERISTICS	A	B
	Suspected Release (100 = 32)	No Suspected Release (100 = 100)
14. A. If you have identified any primary target for surface water (pages 12, 14, or 15), assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.		
B. If you have NOT identified any primary target for surface water, assign the waste characteristics score calculated on page 4.	32	100
WC =	32	

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score (from page 12)	Targets (T) Score (pages 12, 14, 15)	Pathway Waste Characteristics (WC) Score - (determined above)	Threat Score $LR \times T \times WC$ / 82,500
Drinking Water	550	10	32	2.13
Human Food Chain	550	300	32	64
Environmental	550	300	32	64

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

100

$$\begin{array}{r}
 2.13 \\
 64.00 \\
 64.00 \\
 \hline
 130.13 \\
 \text{cap of } \boxed{100.00}
 \end{array}$$

SOIL EXPOSURE PATHWAY CRITERIA LIST

Areas of surficial contamination can generally be assumed. This "Criteria List" helps guide the process of developing a hypothesis concerning the exposure of specific targets to a hazardous substance at the site. Use the "Resident Population" section to evaluate site and source conditions that may help identify targets likely to be exposed to a hazardous substance. The check-boxes record your professional judgment. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypothesis, list them at the bottom of the page or attach an additional page.

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question.

SOIL EXPOSURE PATHWAY CRITERIA LIST

SUSPECTED CONTAMINATION	RESIDENT POPULATION
Surficial contamination can generally be assumed.	<p>Y N U e o n s</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Does any neighboring property warrant sampling?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Other criteria? _____</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> RESIDENT POPULATION IDENTIFIED?</p>

Summarize the rationale for Resident Population (attach an additional page if necessary):

The nearest house is 400 yards away from the site. It is located in a neighborhood. The nearest school is $\frac{1}{2}$ mile away. Only the workers at the site should come in contact with contaminated soil.

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Identify people who may be exposed to a hazardous substance because they work at the facility, or reside or attend school or daycare on or within 200 feet of an area of suspected contamination. If the site is active, estimate the number of full and part-time workers. Note that evaluation of targets is based on current site conditions.

Likelihood of Exposure (LE)

1. **Suspected Contamination:** Areas of surficial contamination are present at most sites, and a score of 550 can generally be assigned as a default measure. Assign zero, which effectively eliminates the pathway from further consideration, only if there is no surficial contamination; reliable analytical data are generally necessary to make this determination.

Resident Population Threat Targets (T)

2. **Resident Population** corresponds to "primary targets" for the migration pathways. Use professional judgment guided by the Soil Exposure Pathway Criteria List (page 18) to determine if there are people living or attending school or daycare on or within 200 feet of areas of suspected contamination. Record the number of people identified as resident population and multiply by 10 to determine the Resident Population factor score.

3. **Resident Individual:** Assign 50 if you have identified a resident population; otherwise, assign zero.

4. **Workers:** Estimate the number of full and part-time workers at this facility and adjacent facilities where contamination is also suspected. Assign a score for the Workers factor from the table.

5. **Terrestrial Sensitive Environments:** In the table provided, list each terrestrial sensitive environment located on an area of suspected contamination. Use PA Table 7 (page 20) to assign a value for each. Sum the values and assign the total as the factor score.

6. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use on an area of suspected contamination.

Sum the target scores.

Waste Characteristics (WC)

7. Enter the WC score determined on page 4.

Resident Population Threat Score: Multiply the scores for LE, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

Nearby Population Threat Score: Do not evaluate this threat if you gave a zero score to Likelihood of Exposure. Otherwise, assign a score based on the population within a 1-mile radius (use the same 1-mile radius population you evaluate for air pathway population targets):

<u>Population Within One Mile</u>	<u>Nearby Population Threat Score</u>
< 10,000	1
10,000 to 50,000	2
> 50,000	4

Soil Exposure Pathway Score: Sum the Resident Population Threat score and the Nearby Population Threat score, subject to a maximum of 100.

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics	
Do any people live on or within 200 ft of areas of suspected contamination?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Is the facility active? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, estimate the number of workers: <u>75</u>	

LIKELIHOOD OF EXPOSURE

1. SUSPECTED CONTAMINATION: Surficial contamination can generally be assumed, and a score of 550 assigned. Assign zero only if the absence of surficial contamination can be confidently demonstrated.

LE =

550

RESIDENT POPULATION THREAT TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or daycare on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18).

_____ people x 10 =

0

3. RESIDENT INDIVIDUAL: If you have identified a resident population (factor 2), assign a score of 50; otherwise, assign a score of 0.

0

4. WORKERS: Use the following table to assign a score based on the total number of workers at the facility and nearby facilities with suspected contamination:

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
> 1,000	15

5

5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Use PA Table 7 to assign a value for each terrestrial sensitive environment on an area of suspected contamination:

Terrestrial Sensitive Environment Type	Value
_____	_____
_____	_____

Sum =

0

6. RESOURCES

5

T =

10

WASTE CHARACTERISTICS

7. Assign the waste characteristics score calculated on page 4.

WC =

32

RESIDENT POPULATION THREAT SCORE:

$$\frac{LE \times T \times WC}{82,500}$$

2.1333

NEARBY POPULATION THREAT SCORE:

1.0

SOIL EXPOSURE PATHWAY SCORE:

Resident Population Threat + Nearby Population Threat

3.133

$$\frac{550 \times 10 \times 32}{82,500}$$

**PA TABLE 7: SOIL EXPOSURE PATHWAY
TERRESTRIAL SENSITIVE ENVIRONMENT VALUES**

<i>Terrestrial Sensitive Environment</i>	<i>Assigned Value</i>
Terrestrial critical habitat for Federally designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument	
Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species	75
National Preserve (terrestrial)	
National or State terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	
Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	
Terrestrial habitat used by State designated endangered or threatened species	50
Terrestrial habitat used by species under review for Federal designated endangered or threatened status	
State lands designated for wildlife or game management	25
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	

AIR PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing a hypothesis as to whether a release to the air is likely to be detected. The check-boxes record your professional judgment. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypothesis, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several conditions that could provide insight as to whether a release from the site is likely to be detected. If a release is suspected, primary targets are any residents, workers, students, and sensitive environments on or within $\frac{1}{4}$ mile of the site.

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

AIR PATHWAY CRITERIA LIST

SUSPECTED RELEASE	PRIMARY TARGETS
<p>Y N U e o n s</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Are odors currently reported?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Has release of a hazardous substance to the air been directly observed?</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?</p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Does analytical or circumstantial evidence suggest a release to the air?</p> <p><input type="checkbox"/> <input type="checkbox"/> Other criteria? _____</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> SUSPECTED RELEASE?</p>	<p>If you suspect a release to air, evaluate all populations and sensitive environments within 1/4 mile (including those on-site) as primary targets.</p> <p>None</p>

Summarize the rationale for Suspected Release (attach an additional page if necessary):

No suspected Release

AIR PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Air Pathway Criteria List (page 21) to hypothesize whether you suspect that a hazardous substance release to the air could be detected. Due to dispersion, releases to air are not as persistent as releases to water migration pathways and are much more difficult to detect. Develop your hypothesis concerning the release of hazardous substances to air based on "real time" considerations. Record the distance (in feet) from any source to the nearest regularly occupied building.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Air Pathway Criteria List (page 21). If you suspect a release to air, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, enter 500 and use only Column B for this pathway.

Targets (T)

3. **Primary Target Population:** Evaluate populations subject to exposure from release of a hazardous substance from the site. If you suspect a release, the resident, student, and worker populations on and within $\frac{1}{4}$ mile of the site are considered primary target population. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine the population. In the space provided, enter this population. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations in distance categories not suspected to be subject to exposure from release of a hazardous substance from the site. If you suspect a release, residents, students, and workers in the $\frac{1}{4}$ - to 4-mile distance categories are secondary target population. If you do not suspect a release, all residents, students, and workers onsite and within 4 miles are considered secondary target population.

Use PA Table 8 (page 23). Enter the population in each secondary target population distance category, circle the assigned value, and record it on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Individual** represents the threat posed to the person most likely to be exposed to a hazardous substance release from the site. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 8 (page 23) for the closest distance category in which you have identified a secondary target population.

6. **Primary Sensitive Environments:** If a release is suspected, all sensitive environments on or within $\frac{1}{4}$ mile of the site are considered primary targets. List them and assign values for sensitive environment type (from PA Table 5, page 16) and/or wetland acreage (from PA Table 9, page 23). Sum the values and enter the total as the factor score.

7. **Secondary Sensitive Environments:** If a release is suspected, sensitive environments in the $\frac{1}{4}$ - to $\frac{1}{2}$ -mile distance category are secondary targets; greater distances need not be evaluated because distance weighting greatly diminishes the impact on site score. If you do not suspect a release, all sensitive environments on and within $\frac{1}{4}$ mile of the site are considered secondary targets. List each secondary sensitive environment on PA Table 10 (page 23) and assign a value to each using PA Tables 5 and 9. Multiply each value by the indicated distance weight and record the product in the far-right column. Sum the products and enter the total as the factor score.

8. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use within $\frac{1}{2}$ mile.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

9. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for the air pathway, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Air Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

AIR PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Air Pathway Criteria List, page 21)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Distance to the nearest individual:	<u>150</u> ft

LIKELIHOOD OF RELEASE

- SUSPECTED RELEASE:** If you suspect a release to air (see page 21), assign a score of 550. Use only column A for this pathway.
- NO SUSPECTED RELEASE:** If you do not suspect a release to air, assign a score of 500. Use only column B for this pathway.

	A	B	Reference
	Suspected Release	No Suspected Release	
	550	500	
LR =	550	500	

TARGETS

- PRIMARY TARGET POPULATION:** Determine the number of people subject to exposure from a suspected release of hazardous substances to the air.
_____ people x 10 =
- SECONDARY TARGET POPULATION:** Determine the number of people not suspected to be exposed to a release to air, and assign the total population score using PA Table 8.
- NEAREST INDIVIDUAL:** If you have identified any Primary Target Population for the air pathway, assign a score of 50; otherwise, assign the Nearest Individual score from PA Table 8.
- PRIMARY SENSITIVE ENVIRONMENTS:** Sum the sensitive environment values (PA Table 8) and wetland acreage values (PA Table 9) for environments subject to exposure from a suspected release to the air.

Sensitive Environment Type	Value

	A	B	Reference
	Suspected Release	No Suspected Release	
		22	
		20	
Sum =			
		9.8	
		5	
T =		49.285	

WASTE CHARACTERISTICS

- If you have identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.
 - If you have NOT identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4.

	A	B	Reference
	Suspected Release	No Suspected Release	
		32	
WC =		32	

AIR PATHWAY SCORE:

$$\frac{LR \times T \times WC}{82,500}$$

$$\frac{500 \times 49.285 \times 32}{82,500}$$

9.558

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category													Population Value	
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 2,000	2,001 to 10,000	10,001 to 20,000	20,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000			
Onsite	_____	20	1	2	5	10	52	103	521	1,033	5,214	10,326	52,138	103,240	_____		
> 0 to 1/4 mile	<u>100</u>	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	<u>4</u>		
> 1/4 to 1/2 mile	<u>109</u>	2	0	0	1	1	3	9	28	88	282	882	2,816	8,815	<u>1</u>		
> 1/2 to 1 mile	<u>3,004</u>	1	0	0	0	1	1	3	8	28	83	201	634	2,012	<u>8</u>		
> 1 to 2 miles	<u>10,360</u>	0	0	0	0	0	1	1	3	8	27	83	268	833	<u>8</u>		
> 2 to 3 miles	<u>1,988</u>	0	0	0	0	0	1	1	1	4	12	38	120	376	<u>1</u>		
> 3 to 4 miles	<u>105</u>	0	0	0	0	0	0	1	1	2	7	23	73	229	<u>0</u>		
Nearest Individual =		20														Score =	22

PA TABLE 9: AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
Less than 1 acre	0
1 to 50 acres	25
Greater than 50 to 100 acres	75
Greater than 100 to 150 acres	125
Greater than 150 to 200 acres	175
Greater than 200 to 300 acres	250
Greater than 300 to 400 acres	350
Greater than 400 to 500 acres	450
Greater than 500 acres	500

PA TABLE 10: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY SECONDARY SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from PA Table 6 or 9)		Product
Onsite	0.10	Habitat / Fed. End.	75	1.88
0-1/4 mi	0.025	Habitat / Fed. End.	75	.405
1/4-1/2 mi	0.0084	Habitat / Fed. End.	75	
Total Environments Score =				2.285

SITE SCORE CALCULATION

In the column labeled S, record the Ground Water Pathway score, the Surface Water Pathway score, the Soil Exposure Pathway score, and the Air Pathway score. Square each pathway score and record the result in the S^2 column. Sum the squared pathway scores. Divide the sum by 4, and take the square root of the result to obtain the Site Score.

SUMMARY

Answer the summary questions, which ask for a qualitative evaluation of the relative risk of targets being exposed to a hazardous substance from the site. You may find your responses to these questions a good cross-check against the way you scored the individual pathways. For example, if you scored the ground water pathway on the basis of no suspected release and secondary targets only, yet your response to question #1 is "yes," this presents apparently conflicting conclusions that you need to reconsider and resolve. Your answers to the questions on page 24 should be consistent with your evaluations elsewhere in the PA scoresheets package.

SITE SCORE CALCULATION

	S	S ²
GROUND WATER PATHWAY SCORE (S _{gw}):	0.9697	.9403
SURFACE WATER PATHWAY SCORE (S _{sw}):	100.00	10,000.0
SOIL EXPOSURE PATHWAY SCORE (S _s):	3.133	9.8157
AIR PATHWAY SCORE (S _a):	9.558	91.36
SITE SCORE:	$\sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$	50.25

SUMMARY

	YES	NO
<p>1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water?</p> <p>A. If yes, identify the well(s). _____</p> <p>B. If yes, how many people are served by the threatened well(s)? _____</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?</p> <p>A. Drinking water intake</p> <p>B. Fishery</p> <p>C. Sensitive environment (wetland, critical habitat, others)</p> <p>D. If yes, identify the target(s). _____</p> <p>_____</p> <p>_____</p>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<p>3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility?</p> <p>If yes, identify the property(ies) and estimate the associated population(s). _____</p> <p>_____</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>4. Are there public health concerns at this site that are not addressed by PA scoring considerations? If yes, explain: _____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>